208

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Dewald	ET-171-20, ET-190D (Revised), FT-200 (Revised), G-174, G-201, G-210, G-211 Tel. Rec.	208-3
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AIRCASTLE
MODELS 610.CL152B, M

AIRCASTLE
MODELS 610.CL152B, M

TRADE NAME	Aircastle Models 610.CL152B, M
SUPPLIER	Spiegel, Inc., 1061 W. 35th. St., Chicago 9, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	538-1650 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Turn tuning capacitor fully closed and set pointer parallel with base of dial at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2 A3, A4	Adjust to maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1650KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

AIRCASTLE
MODEL 610.CL152B

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		AIRCASTLE PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■50	150	CE-601	AFH2-16		BO16		FP214	TVL-2435	
B	▲50	150								
C2	.1	600	C208	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C3	12									
C4	100		CC200	SI100NP0	TCZ-100		NP0-333-101	ZT-531	5TCC-T1	
C5A	220									
B	.005									
C	250		♦		♦PC-151		♦1408-02		♦103C5	
D										
E	.005									
C6	.01	600	C206	P688-01	D6-103	PTE6S1	811-01	PT611	6TM-S1	
C7	.05	400	C204	489ZX-05		PJ4S5		PT415	4TM-S5	
C8	.1	400	C14L	P488-1	DF-104	PTE4P1		PT401	4TM-P1	Note 1

Note 1. When replacing this item with other than manufacturer's original part, rewind coil on cap exactly as original.

♦ Items C5A, C5B, C5C, C5D, C5E, R4A, R4B, R4C are combined in one unit .
When replacing items separately C5C and C5D should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	750KΩ	½	RV-152	Q13-137	AG-79-Z	B-70	U-51	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRCASTLE PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	2Meg	½	R310		
R4A	6.8Meg	½		BTS-6.8Meg	Note 1
B	470KΩ	½	♦	BTS-470K	Note2
C	470KΩ	½		BTS-470K	

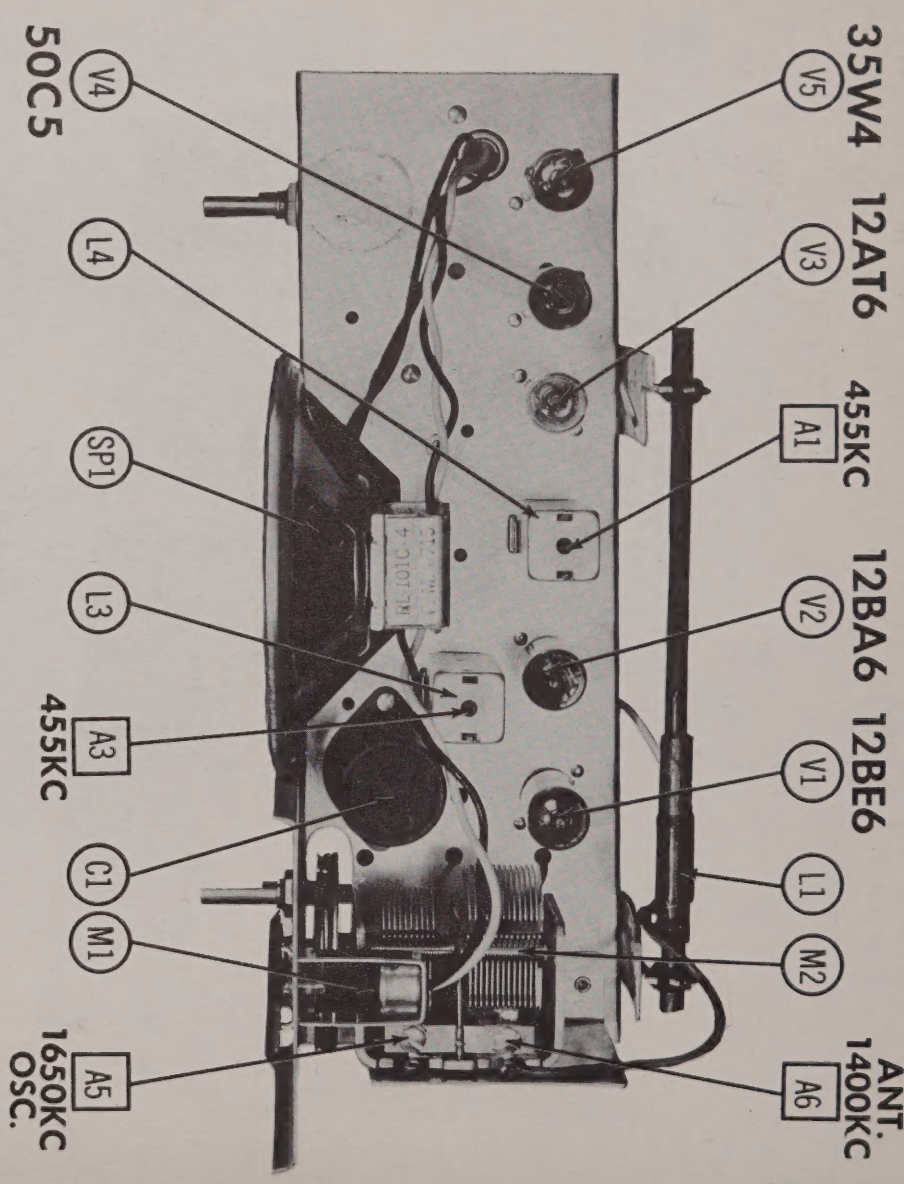
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRCASTLE PART No.	IRC PART No.	
R5	150Ω	½		BTS-150	
R6	33Ω	½			Note 3
R7	1500Ω	1	R314	BTA-1500	
R8	240KΩ	½			
R9	82Ω	½		BTS-82	Note 4

♦ Items R4A, R4B, R4C, C5A, C5B, C5C, C5D, C5E are combined in one unit.
Note 1. Some Models may use a 10Meg resistor in this application.
Note 2. Some Models may use a 250KΩ resistor in this application.
Note 3. Some Models may use a 27Ω resistor in this application.
Note 4. Not used in all Models.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.8KΩ	.3.5Ω	150Ω	.5Ω	TV-715	A-3876	A-2928	RO-302	S-1X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.5Ω	PM-715	ST-105 Mod. P5-X	5A07	

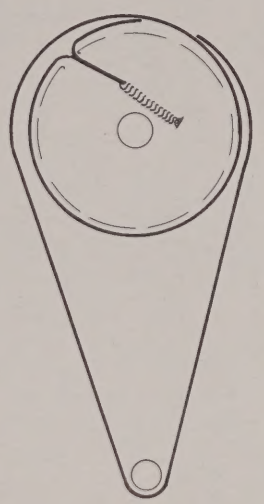
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AIRCASTLE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	.4Ω		L-A51				
L2	Osc. Coil	8.5Ω		L-201			71-Osc *	Tapped @ .9Ω
L3	Input IF	18Ω	17Ω	1655-16	16-6758	BC-352	12-C1	
L4	Output IF	18Ω	17Ω	1655-16	16-6758	BC-353	12-C2	

* Drill mounting hole.

MISCELLANEOUS

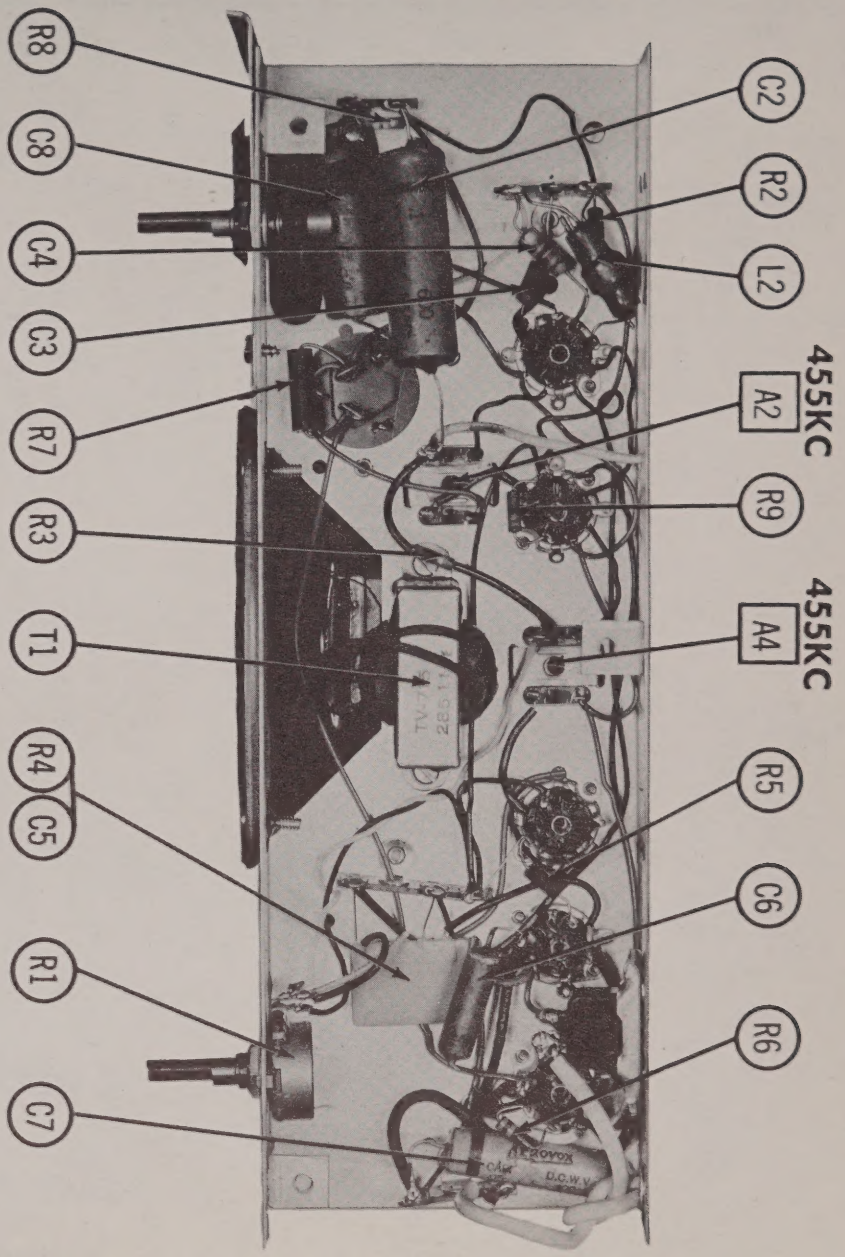
ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M1	Dial Light	T-47	Bayonet 6-8V, .15A, Type 47
M2	Tuner	CV-149	43-462MMF, 34-200MMF
	Cabinet	H-100	Model 610. CL152 (Specify Blonde or Mahogany)
	Knob	H-101	Model 610. CL152 (Specify Blonde or Mahogany)
	Dial Pointer	H-102	
	Dial Window	H-152	



TUNING GANG FULLY OPEN

DIAL CORD DRIVE

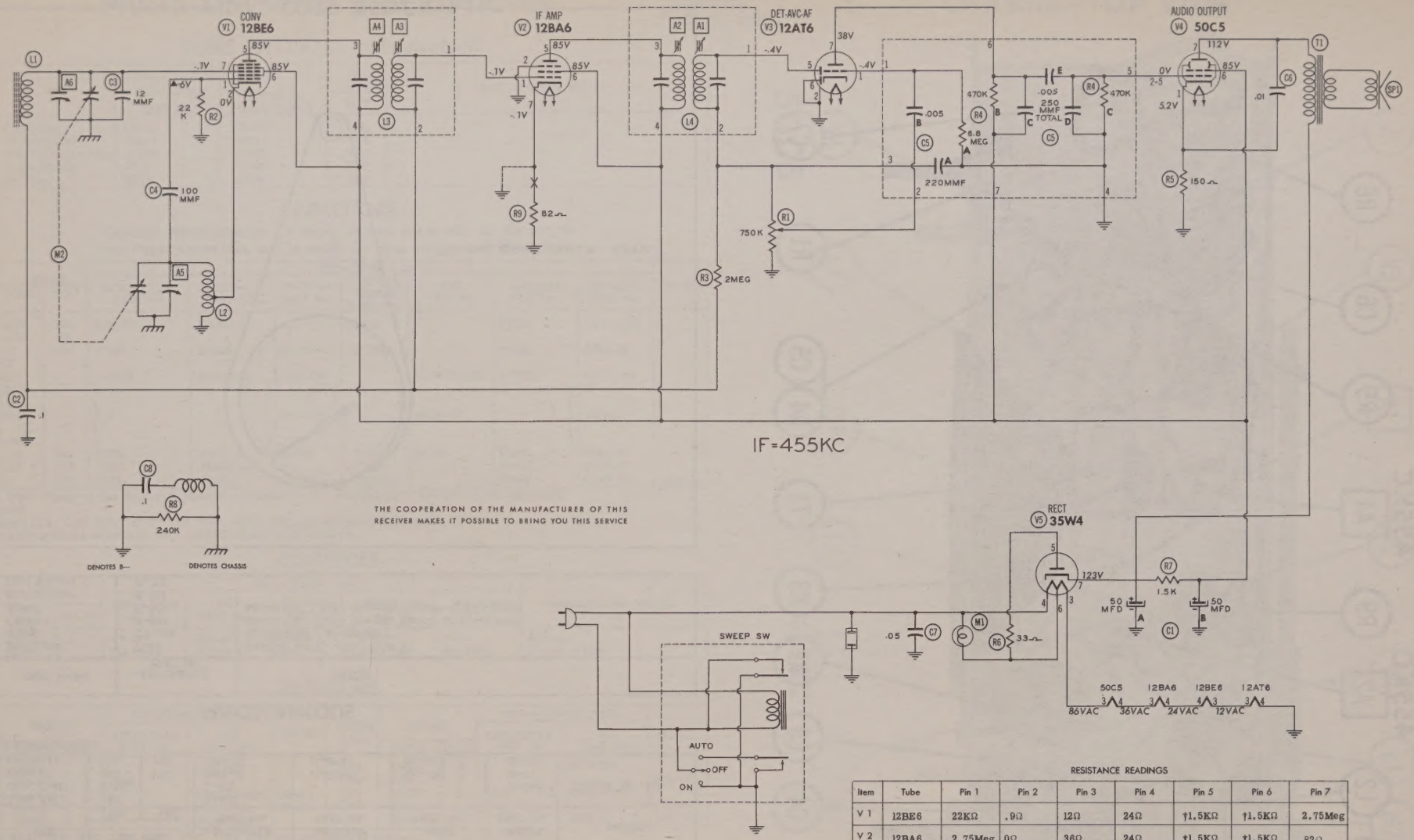
CHASSIS—BOTTOM VIEW



SET 208 FOLDER 1

AIRCASTLE MODEL 610. CL152B

AIRCASTLE MODEL 610. CL152B



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.9Ω	12Ω	24Ω	†1.5KΩ	†1.5KΩ	2.75Meg
V 2	12BA6	2.75Meg	0Ω	36Ω	24Ω	†1.5KΩ	†1.5KΩ	82Ω
V 3	12AT6	6.8Meg	0Ω	12Ω	0Ω	750KΩ	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	86Ω	36Ω	470KΩ	†1.5KΩ	†150Ω
V 5	35W1	INF	INF	86Ω	117Ω	108Ω	112Ω	2.2Meg

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V5.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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208-1

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ARVIN MODELS 6173TM-UHF (Ch. TE332), 6213TB-UHF, 6213TM-UHF, 6215CB-UHF, 6215CM-UHF (Ch. TE330)

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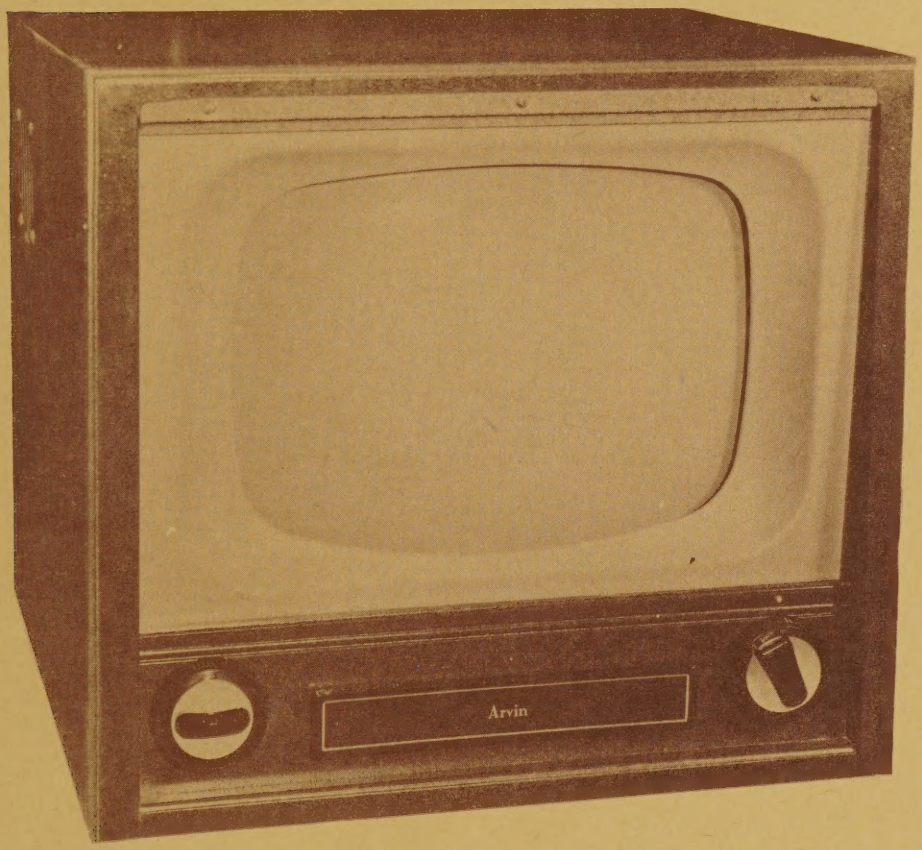

MODEL 6173TM-UHF

ARVIN MODELS 6173TM-UHF (Ch. TE332), 6213TB-UHF, 6213TM-UHF, 6215CB-UHF, 6215CM-UHF (Ch. TE330)

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DATE 7-53 SET 208 FOLDER 2

PHOTOFACT* Folder
*TRADE MARK

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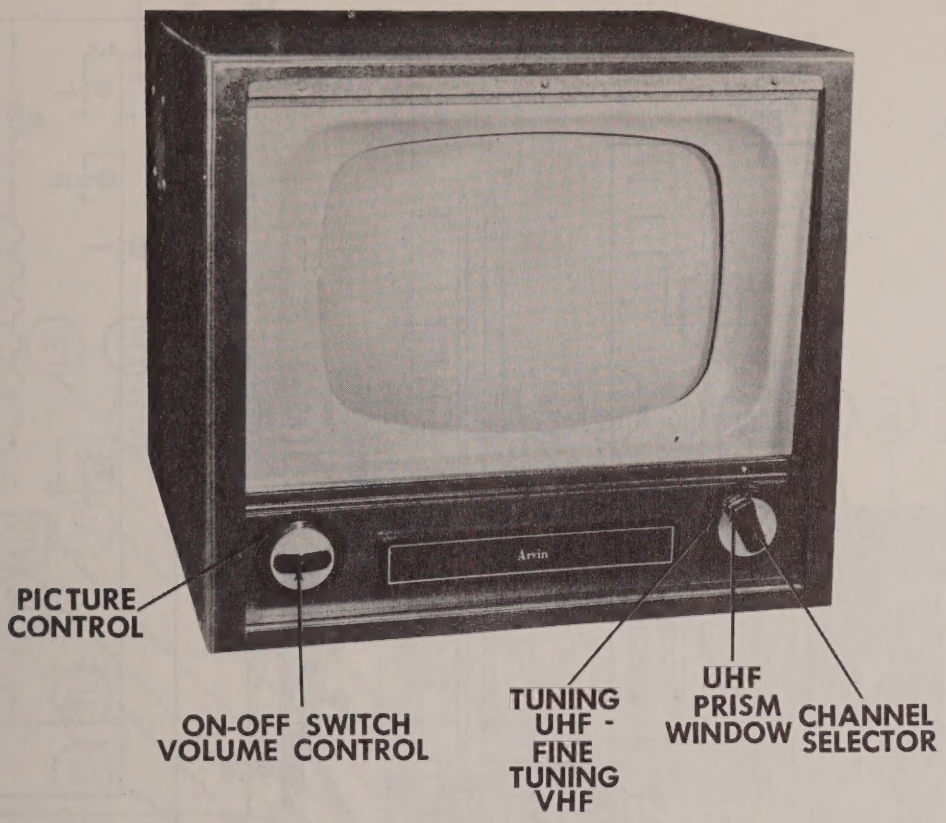

ARVIN MODEL 6173TM

TRADE NAME	Arvin Models 6173TM-UHF (Ch. TE332, -1) 6213TB-UHF, 6213TM-UHF, 6215CB-UHF, 6215CM-UHF (Ch. TE330)
MANUFACTURER	Arvin Industries , Columbus, Indiana
TYPE SET	Television Receiver
TUBES	Twenty-Four

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.9 Amp. @ 117 Volts AC
TUNING RANGE-Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier).

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ARVIN MODELS 6173TM-UHF (Ch. TE332), 6213TB-UHF, 6213TM-UHF, 6215CB-UHF, 6215CM-UHF (Ch. TE330)

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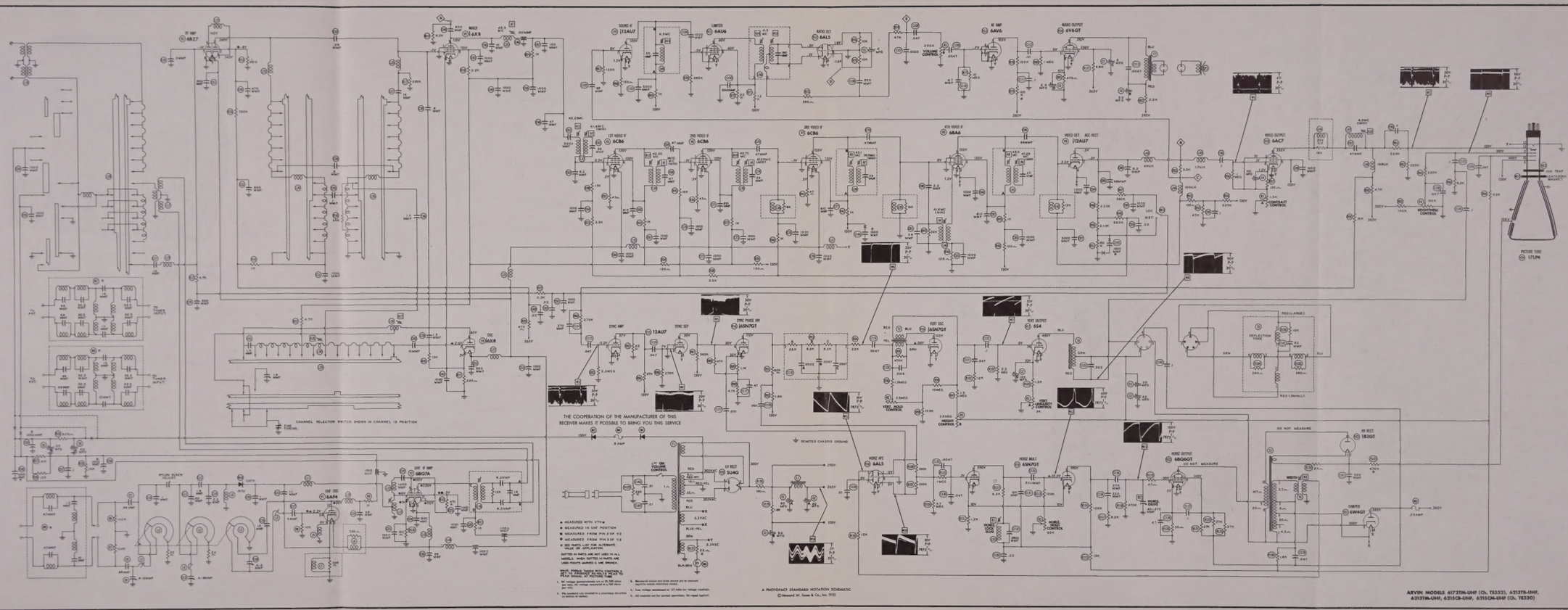

ARVIN MODELS 6173TM-UHF (Ch. TE332), 6213TB-UHF, 6213TM-UHF, 6215CB-UHF, 6215CM-UHF (Ch. TE330)

ARVIN MODELS 6173TM-UHF (Ch. TE332), 6213TB-UHF, 6213TM-UHF, 6215CB-UHF, 6215CM-UHF (Ch. TE330)

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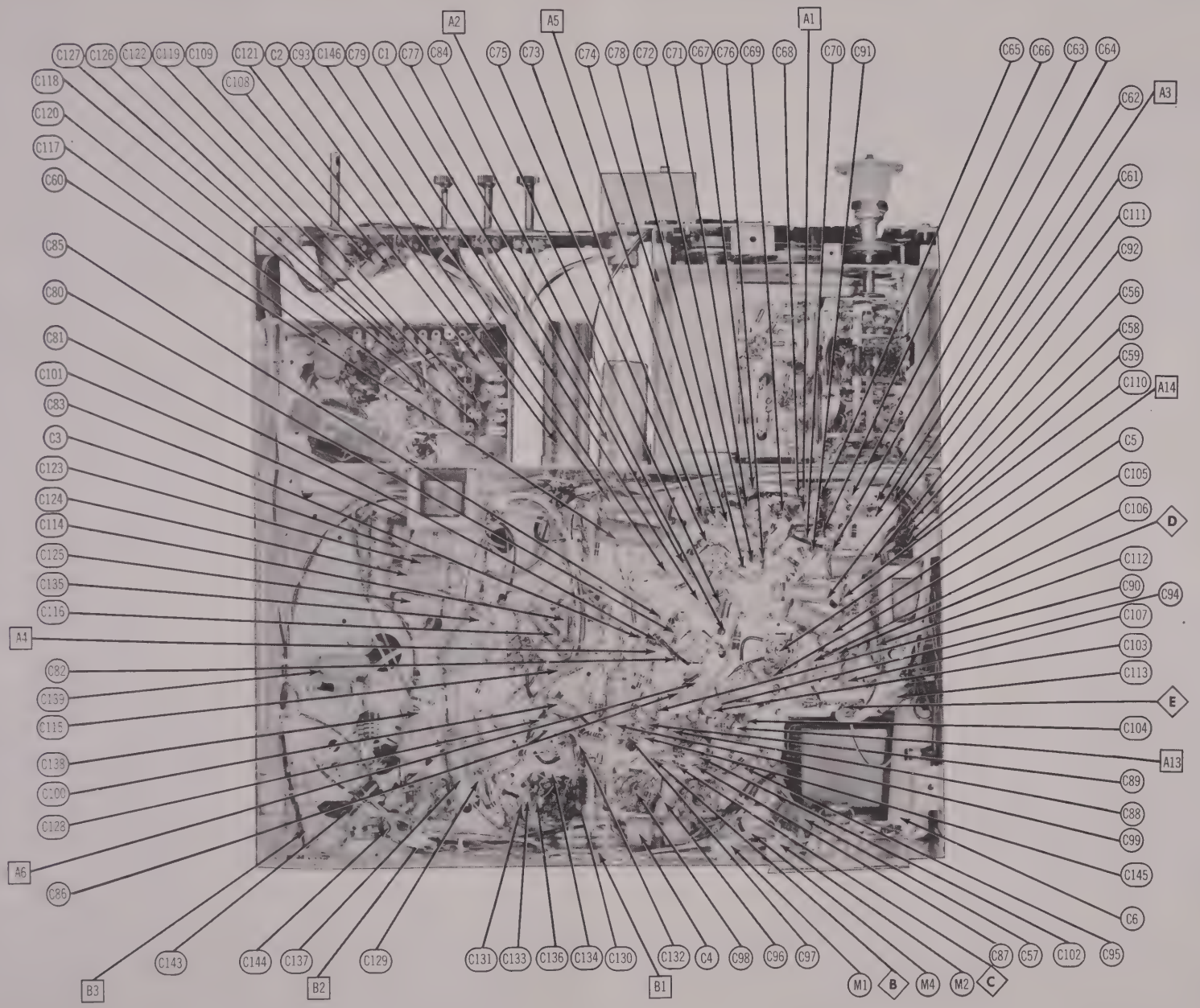
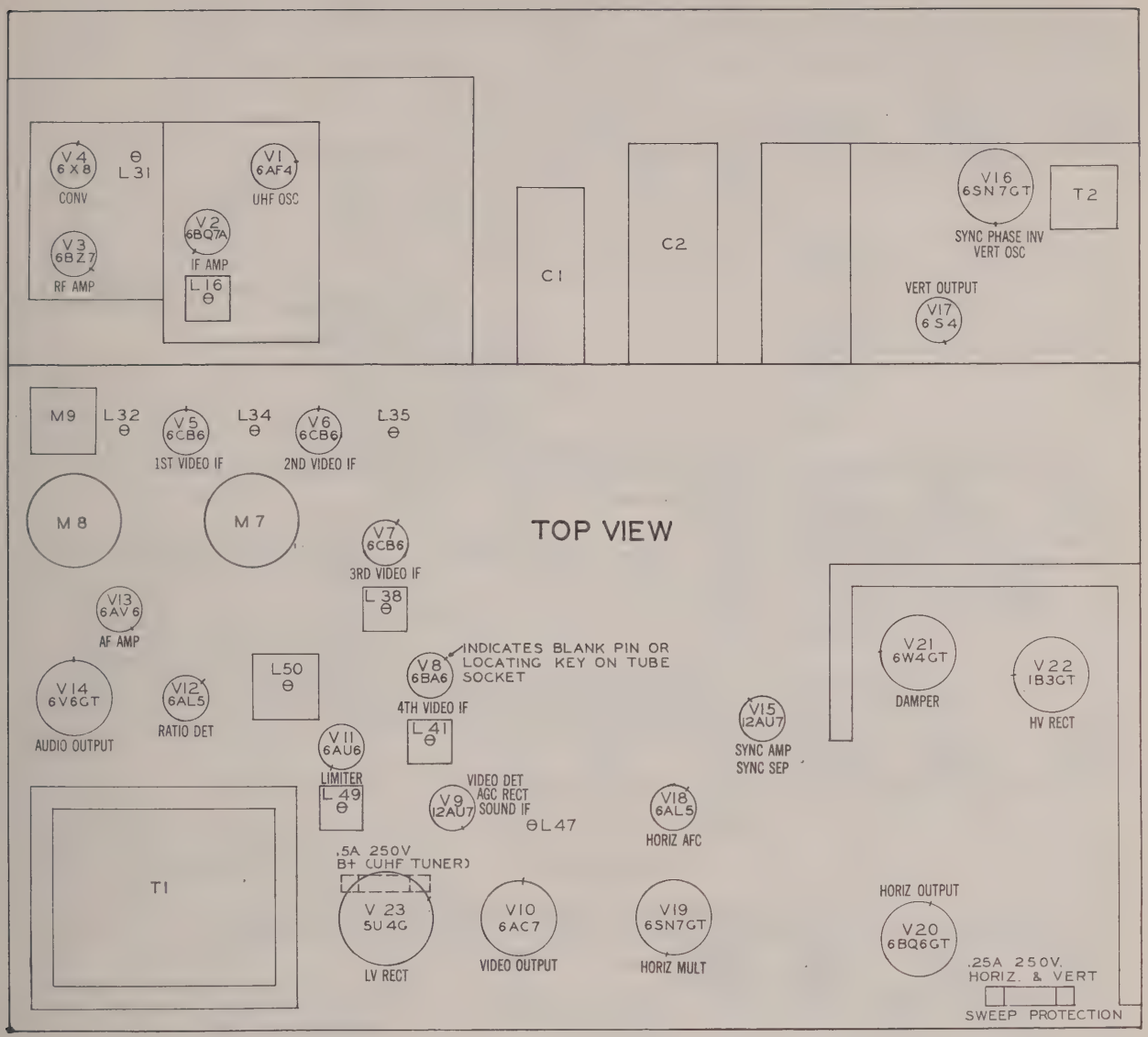
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V23

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V4, V5, V6, V7, V8, V9 (V1, Sel. Rect.(M1 & M2) Fuse (M4) UHF only
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V10, V24
Has pic, no sound - V9, V11, V12, V13, V14

SYNC FAILURE
No vert. sync - V16
No horiz. sync - V16, V18, V19
No vert. or horiz. sync - V15, V16

SWEEP FAILURE
No raster, has sound - V19, V20, V21, V22, V24, Fuse (M3)
No vertical deflection - V16, V17
Poor vert. linearity or foldover - V16, V17
Poor horiz. linearity or foldover - V19, V20, V21
Narrow picture - V19, V20, V21, V22, V23
Vert. off freq. - V16
Horiz. off freq. - V16, V18, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the junction of R48 and R50 Connect the positive lead to chassis. Set the Local-Distance switch to "Local" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to tuner test point (A). Low side to chassis.	39.75MC (Unmod.)	Any non-interfering channel	DC probe to point (B). Common to point (C).	A1, A2	Adjust for MINIMUM deflection.
2.	"	"	41.6MC	"	"	A3, A4	"
3.	"	"	47.25MC	"	"	A5, A6	"
4.	"	"	45.3MC	"	"	A7	Preset core to maximum clockwise position. Adjust for maximum deflection.
5.	"	"	45.0MC	"	"	A8	Adjust for maximum deflection.
6.	"	"	43.1MC	"	"	A9	"
7.	"	"	45.75MC	"	"	A10	"
8.	"	"	42.25MC	"	"	A11, A12	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to tuner test point (A). Low side to chassis.	44.0MC (10MC Swp)	41.6MC 42.25MC 42.75MC 45.0MC 45.75MC	Any non-interfering channel	Vert. Amp. to point (B). Low side to chassis.		Check for response curve similar to Fig. 1 with markers as shown. If necessary retouch A7 thru A12 for desired response.
10.	"	"	44.0MC	41.6 MC 42.25MC	"	"		Increase scope gain and decrease sweep width to obtain expanded trace of low frequency end of response curve. If necessary retouch A4 for double humped curve as in Fig. 2.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01MFD	High side to point (B). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point (D). Common to chassis.	A13, A14	Adjust for maximum deflection.
12.	"	"	"	"	DC probe to point (E). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.01MFD	High side to point (B). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interferring channel	Vert. Amp. to point (D). Low side to chassis.	A13 A14	Disconnect stabilizer capacitor C5. Adjust for curve of maximum amplitude and symmetry as in Fig. 3.
12.	"	"	"	"	"	Vert. Amp. to point (E). Low side to chassis.	A15	Reconnect capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

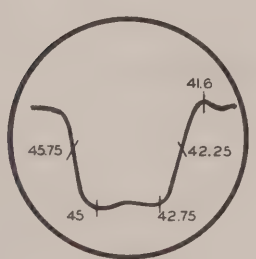


FIG. 1

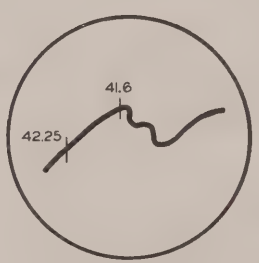


FIG. 2

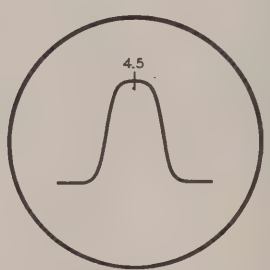


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	.01MFD	High side to point (B). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe thru detector (Fig. 5) to pin 11 of picture tube. Common to chassis.	A16	Adjust for MINIMUM deflection.

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms. Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	215.75MC	13	Vert. Amp. to point (B). Low side to chassis.	A17	Adjust to place sound marker in notch on low frequency side of response curve as in Fig. 6.
15.	"	"	207MC (10MC Swp)	209.75MC	12	"		Check for sound marker placement as in Fig. 6. If necessary make compromise adjustment of A17 for any individual channel, then check all other high band channels to see that they have not been seriously affected.
			201MC (10MC Swp)	203.75MC	11			
			195MC (10MC Swp)	197.75MC	10			
			189MC (10MC Swp)	191.75MC	9			
			183MC (10MC Swp)	185.75MC	8			
			177MC (10MC Swp)	179.75MC	7			
16.	"	"	85MC (10MC Swp)	87.75MC	6	"	A18	Adjust to place sound marker in notch on low frequency side of response curve as in Fig. 6.
17.	"	"	79MC (10MC Swp)	81.75MC	5	"		Check for sound marker placement as in Fig. 6. If necessary make compromise adjustment of A18 for any individual channel, then check all other low band channels to see that they have not been seriously affected.
			69MC (10MC Swp)	71.75MC	4			
			63MC (10MC Swp)	65.75MC	3			
			57MC (10MC Swp)	59.75MC	2			

THE RF AND MIXER PORTIONS OF THE VHF TUNER AND ALL OF THE UHF TUNERS HAVE BEEN PROPERLY ALIGNED AT THE FACTORY AND ARE VERY STABLE. ALIGNMENT OF THESE PORTIONS SHOULD NOT BE REQUIRED IN THE FIELD.

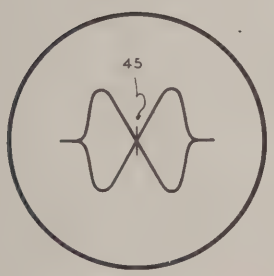


FIG. 4

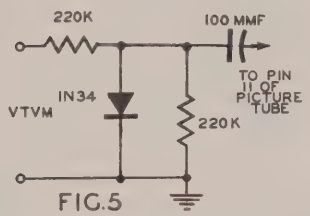


FIG. 5

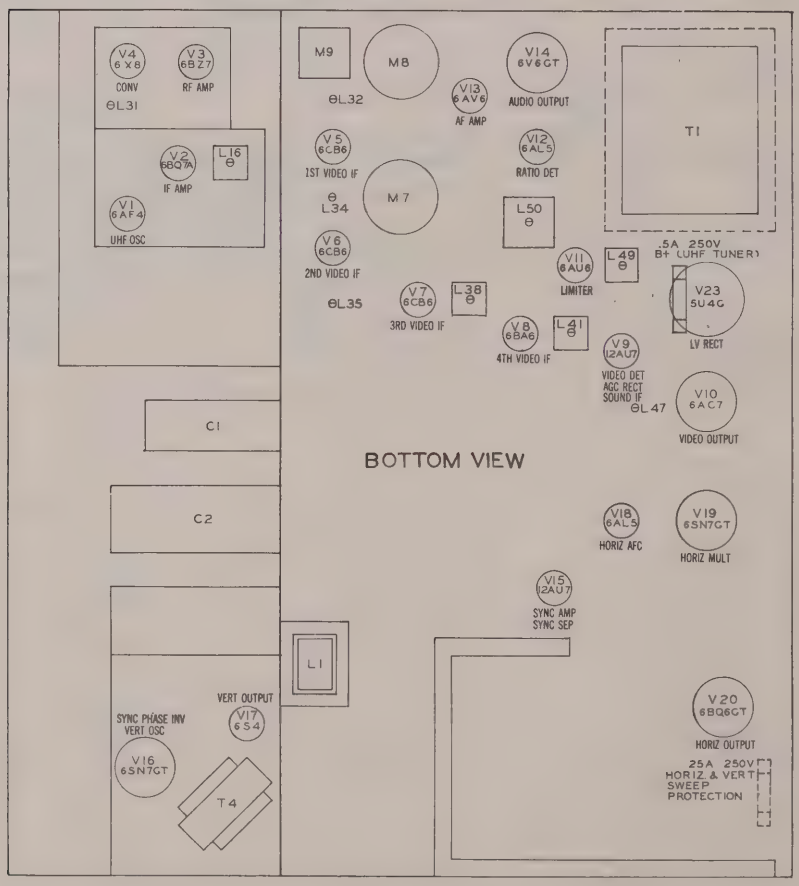
FIG. 6

ARVIN MODELS 6173TM-UHF (Ch. TE332), 6213TB-UHF, 6213TM-UHF, 6215CB-UHF, 6215CM-UHF (Ch. TE330)

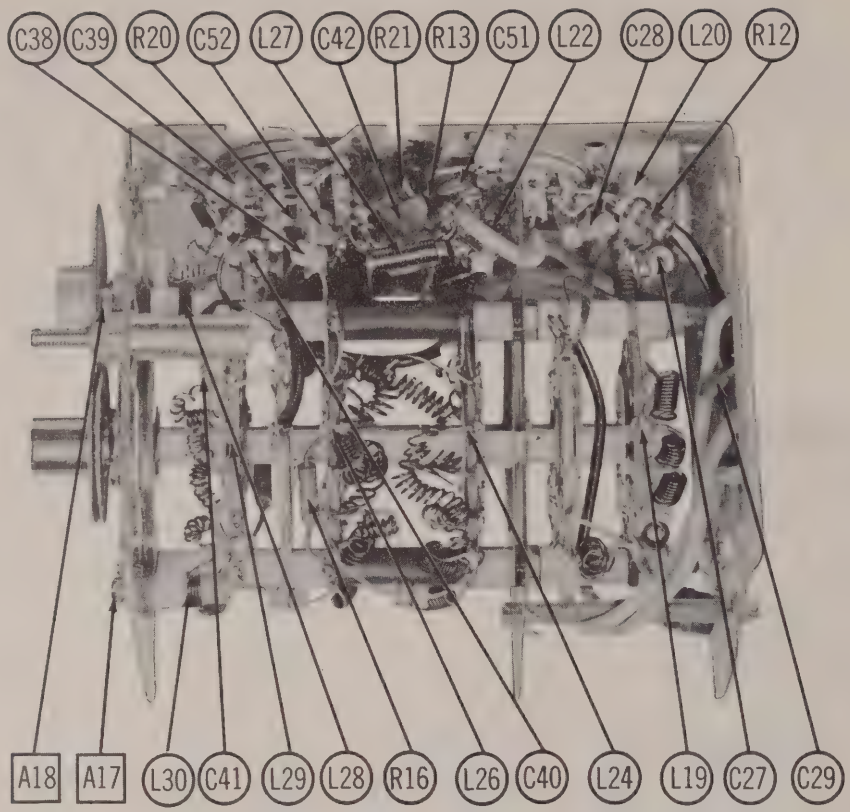
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	♯8KΩ	10KΩ	.1Ω	0Ω	0Ω	10KΩ	♯8KΩ		
V 2	6BQ7A	♯1.8KΩ	INF	INF	0Ω	.1Ω	INF	0Ω	100Ω	0Ω
V 3	6BZ7	†1.5KΩ	† 600KΩ	INF	0Ω	.1Ω	INF	1.3Meg	0Ω	0Ω
V 4	6X8	0Ω	15KΩ	†7KΩ	0Ω	.1Ω	220KΩ	220KΩ	†4KΩ	†3KΩ
V 5	6CB6	900KΩ	47Ω	0Ω	.1Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 6	6CB6	900KΩ	47Ω	.1Ω	0Ω	†3KΩ	†3KΩ	0Ω		
V 7	6CB6	880KΩ	47Ω	0Ω	.1Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 8	6BA6	1.6Ω	0Ω	.1Ω	0Ω	†3KΩ	†3KΩ	120Ω		
V 9	12AU7	540KΩ	8.1KΩ	4.8KΩ	.1Ω	.1Ω	†2.8KΩ	120KΩ	150Ω	0Ω
V 10	6AC7	0Ω	0Ω	1KΩ	1 Meg	1.1KΩ	†1.9KΩ	.1Ω	†4.7KΩ	
V 11	6AU6	680KΩ	0Ω	.1Ω	0Ω	11KΩ	11KΩ	0Ω		
V 12	6AL5	10KΩ	10KΩ	0Ω	.1Ω	INF	0Ω	INF		
V 13	6AV6	10Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†250KΩ		
V 14	6V6GT	INF	.1Ω	†2.5KΩ	†6.8KΩ	1 Meg	INF	0Ω	470Ω	
V 15	12AU7	†22KΩ	2.2Meg	0Ω	.1Ω	.1Ω	†70KΩ	0Ω	270KΩ	0Ω
V 16	6SN7GT	2.9Meg	♦1.9Meg	0Ω	52KΩ	†4.5KΩ	5.8KΩ	.1Ω	0Ω	
V 17	6S4	INF	2.5KΩ	2.2Meg	.1Ω	0Ω	2.2Meg	INF	INF	♦3.2KΩ
V 18	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	12KΩ	0Ω	12KΩ		
V 19	6SN7GT	5.7Meg	♦25KΩ	1.2KΩ	115KΩ	♦137KΩ	1.2KΩ	0Ω	.1Ω	
V 20	6BQ6GT	INF	0Ω	INF	†9.2KΩ	470KΩ	INF	.1Ω	50Ω	Top Cap ♦20Ω
V 21	6W4GT	INF	INF	550KΩ	INF	†220Ω	INF	♦25Ω	♦25Ω	
V 22	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ♦437Ω
V 23	5U4G	INF	18KΩ	INF	21.2Ω	INF	22.6Ω	INF	18KΩ	
V 24	17LP4	0Ω	230KΩ	PIN 6 †1.9KΩ	PIN 10 ♦24KΩ	PIN 11 220KΩ	PIN 12 .1Ω			

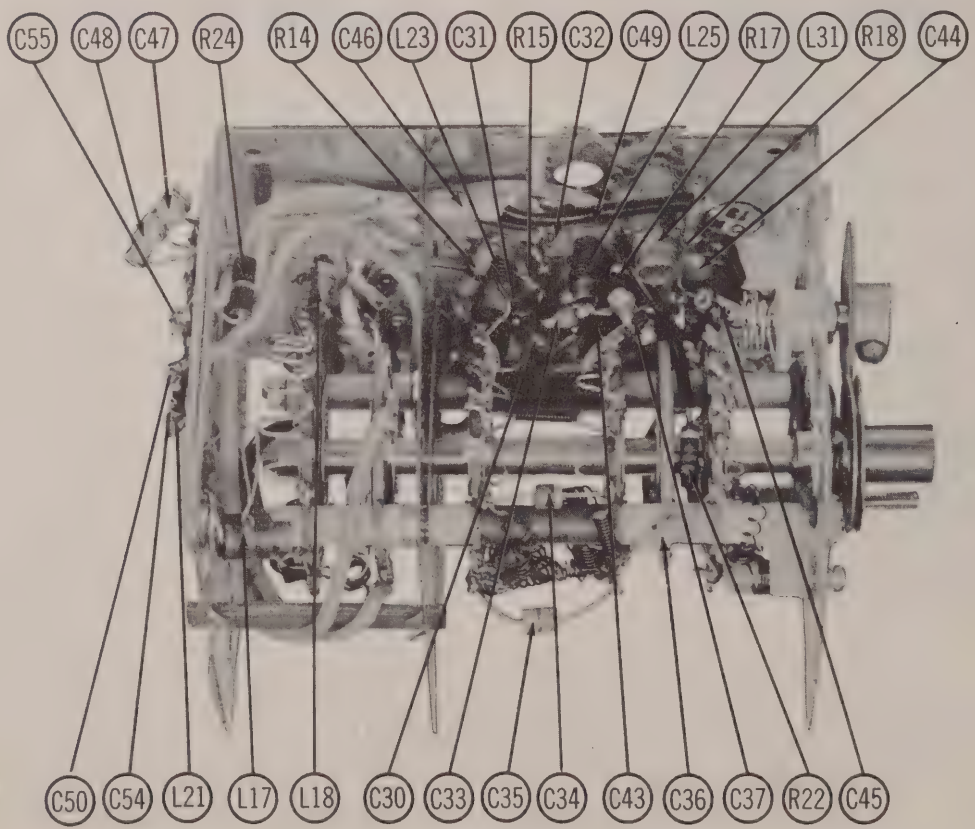
ALL MEASUEMENTS TAKEN WITH LOCAL DISTANCE SWITCH IN LOCAL POSITION .
♦ MEASURED FROM PIN 3 OF V21.
† MEASURED FROM PIN 8 OF V23.
♯ MEASURED FROM M2.



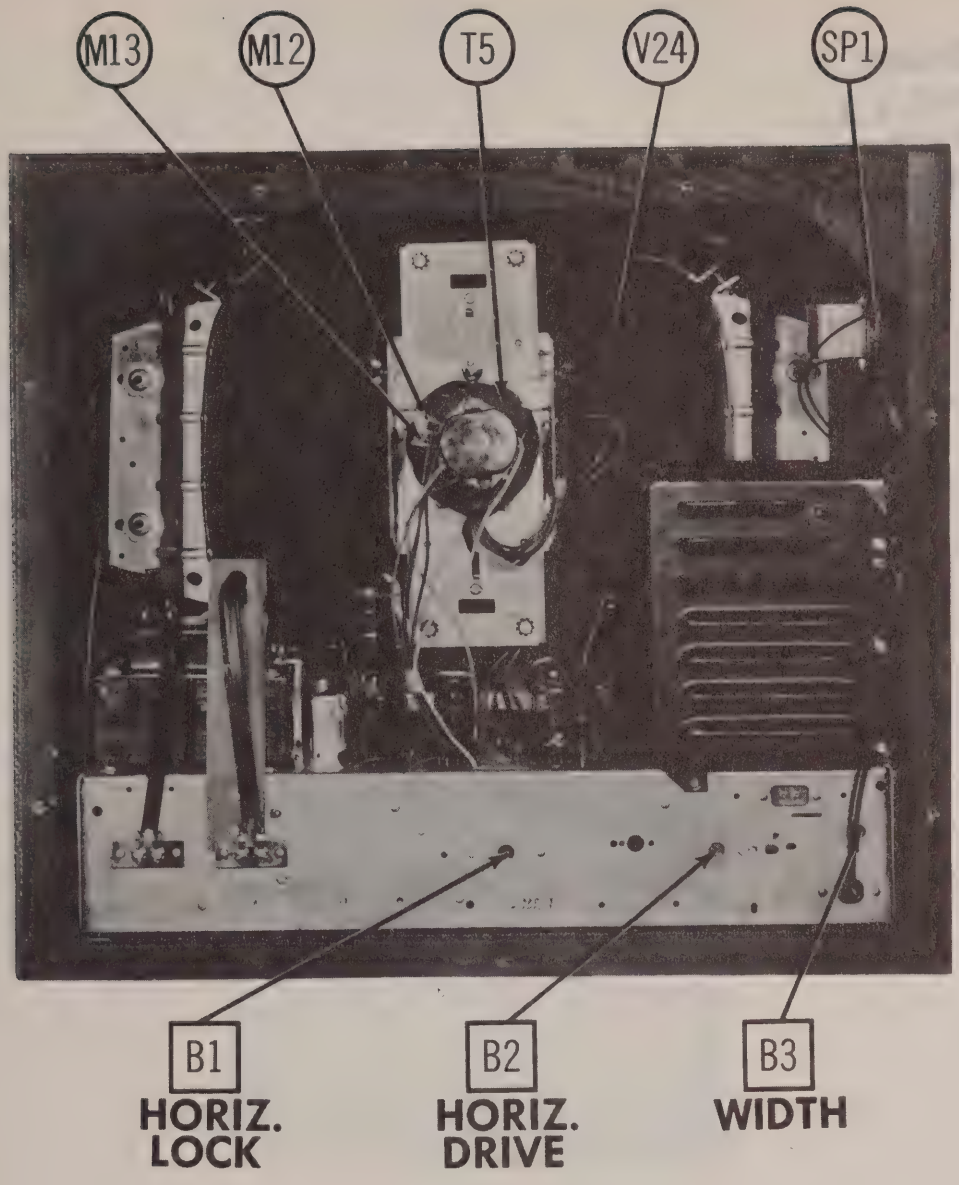
TUBE PLACEMENT CHART



VHF RF TUNER-RIGHT SIDE



VHF RF TUNER-LEFT SIDE



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control 90 degrees from fully clockwise position. Adjust the horizontal lock slug (B1) until the picture synchronizes horizontally.

Turn B1 clockwise until the picture loses sync, then counter clockwise until the picture just falls into sync. Momentarily switch to another channel and back, first with the horizontal hold at one extreme of rotation, then at the other extreme. Picture should lose sync at both extremes. If necessary, make slight readjustment of B1 to center the sync range of the horizontal hold control.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of a vertical white line or compression of the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See LOSS OF HIGH VOLTAGE

INSUFFICIENT SWEEP

Check by substitution V19, V20 and V21.

Check amplitude of signal at W13;

If Insufficient	If Sufficient
Check components of horizontal oscillator and coupling network between V19 and V20.	Check components of horizontal output tube and transformer.

DRIVE LINES

Substitute V20 and V21. Check coupling network between V19 and V20. Check T3 and associated components.

COMPRESSED AT LEFT SIDE

Check by substitution V20 and V21. Check components of shaping network between V19 and V18.

FOLDS

Substitute V21. Check associated components.

VERTICAL

LOSS OF SWEEP

Substitute V16 and V17.

Check waveform at W7;

If Unsatisfactory	If Satisfactory
Check T2 and associated components. Check coupling network between V16 and V17.	Check R2A, T4 and T5B. Check other associated components.

INSUFFICIENT SWEEP

If adjustment of both the height and vertical linearity controls fail to give sufficient height, follow procedure outlined under LOSS OF SWEEP.

COMPRESSED AT TOP

Substitute V16 and V17. Check signal at W7;

If Unsatisfactory	If Satisfactory
Check components of V16 and network between V16 and V17.	Check T4 and Yoke.

COMPRESSED AT BOTTOM

Substitute V17 and check T4, C2B and C3.

WILD VERTICAL OSCILLATOR (Fig. 1)

Check C118 for open.

Fig. 1 WILD VERTICAL OSCILLATOR
See VERTICAL SWEEP

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V15, V16, V18 and V19, Check L51 and other components associated with V18 and V19.

CRITICAL HOLD

Check by substitution V16, V18 and V19, Check horizontal discharge components. Check C133.

PULLING AND OUT OF PHASE

Check C130 for open.

VERTICAL

LOSS OF SYNC

Substitute V15 and V16. Check associated components especially the integrating network.

CRITICAL SYNC

Check by substitution V15, V16 and V17. Check associated components.

TRIGGERING

Check filament lead dressing around vertical oscillator grid leads.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4		
V2A	IF Amplifier	6BQ7A	6BQ7A	9AJ	
B	IF Amplifier	6BZ7	6BZ7	9AJ	
V3	RF Amplifier	6BZ7	6BZ7	9AJ	
V4	Converter	6X8	6X8	9AK	
V5	1st. Video IF Amp.	6CB6	6CB6	7CM	
V6	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V7	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V8	4th. Video IF Amp.	6BA6	6BA6	7BK	
V9	Video Detector - AGC Rectifier - Sound IF Amp.	12AU7	12AU7	9A	
V10	Video Output	6AC7	6AC7		
V11	Limiter	6AU6	6AU6	9A	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AF Amplifier	6AV6	6AV6	7BT	
V14	Audio Output	6V6GT	6V6GT	7S	
V15	Sync. Amplifier - Sync. Seperator	12AU7	12AU7	9A	
V16	Sync. Phase Inv. - Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V17	Vert. Output	6S4	6S4		
V18	Horiz. AFC	6AL5	6AL5	6BT	
V19	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V20	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V21	Damper	6W4GT	6W4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V24A	17LP4	17LP4	12C	
		17VP4	12C	
B	21MP4		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■60	400	E22422-13	AFH4-88				FP431.4	TVL-4709	
B	▲50	350		PRS450/40				TC62		
C	●5	450								
D	20	25								
C2A	■80	350	E22422-14	AFH3-182		CO37		FP420.6	TVL-4711	
B	▲50	350		PRS450/40		BRH501		TC75		
C	●20	450								
D	100	50								
C3	20	450	A25452	PRS450/20		BR2045A		TC75	TVA-1709	
C4	100	25	A25454	PRS25/100		BRH251A		TC2501	TVA-1207	
C5	4	150	A25453	PRS150/4		BR415		TC40	TVA-1402	
C6A	■40	300	E22422-15	AFH2-39		XB013		FP227.3	R1339	
B	▲30	300		PRS350/10				TC62		
C7	.68				TCZ-.68		NP0K-R68			
C8	.68				TCZ-.68		NP0K-R68			
C9	.4-3									
C10	1				TCZ-1		NP0K-010		5TCCB-V1	
C11	.82									
C12	1.8									
C13	.4-3									
C14	2.2			SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C15	1.1									
C16	12									
C17	6							CT565A		
C18	.5-3				829-3					
C19	68			SI68	D6-680		GP1K-680	UC-5468	5GA-Q68	
C20	1				TCZ-1		NP0K-010		5TCCB-V1	
C21	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C22	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C23	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C24	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C25	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C26	68			SI68	D6-680		GP1K-680	UC-5468	5GA-Q68	
C27	15			SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C28	3									
C29	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C30	470			BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C31	1000									
C32	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C33	.39									
C34	.3									
C35	1				TCZ-1		NP0K-010		5TCCB-V1	
C36	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C37	15			SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C38	.8									
C9	1.5						N330K-1R5			
C40	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C41	1.2			SI1.2NP0	TCZ-1.2		NP0K-1R2		5TCCB-V12	
C42	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C43	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C44	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C45	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C46	100									
C47	100			SI100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C48	47						N330L-470			

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C49	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C50	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C51	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C52	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C53	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	Note 2
C54	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C55	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C56	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	Note 1
C57	.1	400	D25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C58	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	Note 1
C59	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	Note 1
C60	.22	400	D25462-224	P488-22		PTE4P22		PT4025	4TM-P22	
C61	5000		C21674	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C62	36									
C63	8.2		C20205-13	SI8.2NP0			NP0K-6R2			
C64	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C65	610		C20351-1							
C66	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C67	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C68	47									
C69	47									
C70	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C71	610		C20351-1							
C72	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C73	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C74	39									
C75	47									
C76	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C77	610		C20351-1							
C78	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C79	47									
C80	2.2		C20205-7							
C81	36									
C82	610		C20351-1							
C83	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C84	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C85	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C86	68		D25530-13							
C87	5000		C21674	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C88	8.2		C20205-13	SI8.2NP0			NP0K-6R2			
C89	68		D25530-13							
C90	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C91	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C92	.22	200	D25455-224	P488-22		PTE4P22		PT4025	2TM-P22	
C93	.22	200	D25455-224	P488-22		PTE4P22		PT4025	2TM-P22	
C94	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C95	.1	200	D25455-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C96	.1	200	D25455-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C97	47				TCZ-47		NP0-333-470		5TCC-Q47	
C98	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C99	.1	400	D25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C100	.047	400	D25462-473	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C101	.047	600	D25461-473	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C102	68		D25530-13							
C103	5000		C21674	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C104	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C105	5000		C21674	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C106	500	500	C20290-501	1469-0005		5R5T5		MCB245	MS-35	
C107	.0033	600	D25461-332	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D3	
C108	.047	200	D25455-473	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C109	.0047	600	D25461-472	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C110	47	500	C20411-470	1468-00005	D6-470	5W5Q5	GP1K-470	MC225	1FM-45	
C111	.1	400	D25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C112	.01	400	D25462-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C113	.0047	600	D25461-472	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C114	270	500	C20290-271	1469-0003	TCZ-270	SR5T3		MCB241	MS-33	
C115	.047	400	D25462-473	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C116	.047	400	D25462-473	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C117	.47	200	D25455-474	P288-47		PJ2P5		PT405	2TM-P47	
C118A	.0022		P688-0022			PTE6D22		PT6222		
B	.0047		P688-0047	+PC-100	+PC-100	PTE6D47	+1405-01	PT6247	+101C1	
C	.0047		P688-0047			PTE6D47		PT6247		
C119	.0047	600	C20324-472	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C120	.0015	600	D25461-152	P688-0015	D6-152	PTE6D15	GP2L-152		6TM-D15	
C121	.047	600	D25461-473	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C122	.1	600	D25461-104	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C123	.022	200	D25455-223	P488-022	DD-203	PTE4S22		PT4122	4TM-S22	
C124	.1	1000		1084-1		TVC10P1		TP439	PX-11	
C125	.1	400	D25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C126	.001	400		P488-001	D6-102	PTE4D1	GP2L-102	PT421	4TM-D1	
C127	.001	600	D25461-102	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C128	.01	400	D25462-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C129	.0047	200		P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C130	.047	400	D25462-473	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C131	100	500	C20290-101	1469-0001	TCZ-100	SR5T1	NP0-333-101	MCB235	MS-31	
C132	3900	500	C24033-392	1464-004		1DR5D4		MCB463	MS-24	
C133	330	500								
C134	330	500	C20290-331							
C135	.22	600	D25461-224	684-2		PTE6P25		PT6025	6TM-P25	
C136	270	500	C20290-271	1469-0003	TCZ-270	SR5T3		MCB241	MS-33	
C137	.1	600	D25461-104	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C138	.47	200	D25455-474	P288-47		PJ2P5		PT405	2TM-P47	
C139	.047	600	D25461-473	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C140	.1	400	D25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C141	500	30000	A24994	HV-21	TV7-502				30DK-T5	
C142	82	5000	C24123-820							
C143	.01	600	C20358-103	689ZX-01		PJ6S1		PT611	6TM-S1	
C144	.01	600	C20358-103	689ZX-01		PJ6S1		PT611	6TM-S1	
C145	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	Note 2
C146	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	Note 2

◆ Items C118A, C118B, C118C, R93A, R93B, R93C are combined in one unit.
Note 1. Not used in Chassis TE330
Note 2. Not used in all Models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500 Ω	½	E22464-27	QJ-349*	RTV-352		UF152L	Contrast-Panel
B	250KΩ	½					UR254A †	Volume-Rear
C	Switch						US-26	Attach to R1B
R2A	2.5Meg	½	E22464-36	Q11-138	AG-83-S	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A
R3A	50KΩ	½	E22464-38	Q11-120	AG-40-S	AB-26	U-29	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R3A
R4A	100KΩ	½	E22464-34	Q11-128	AG-49-S	AB-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R4A
R5A	3000Ω	½	E22464-20	QJ-71**	RTV-259			Vert. Linearity-Panel
B	2.5Meg	½						Height-Rear

† UNIVERSAL REPLACEMENT-(MALLORY EXACT DUPLICATE PART NO. UE133B).
* CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B17-110 & P1-204 (Panel) B13-130 & R1-220 (Rear) & SWITCH 76-1.
** CONCENTRIKIT EQUIVALENT-KIT K-3, BASE ELEMENTS & SHAFTS W11-112 & P3-114 (Panel) B11-239 & R2-124 (Rear).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ARVIN PART No.	IRC PART No.	NOTES
R6	100KΩ	½		BTS-100K	
R7	100KΩ	½		BTS-100K	
R8	10KΩ	½		BTS-10K	
R9	1000Ω	½		BTS-1000	
R10	470KΩ	½			
R11	1000Ω	½		BTS-1000	
R12	4700Ω	½		BTS-4700	
R13	1 Meg-5%	½		BTS-1 Meg-5%	
R14	1000Ω	½		BTS-1000	
R15	750KΩ	½			
R16	3900Ω	½		BTS-3900	
R17	220KΩ	½			
R18	2200Ω	½		BTS-2200	
R19	8200Ω	½			
R20	15KΩ	½		BTS-15K	
R21	220Ω	½		BTS-220	
R22	4700Ω	½		BTS-4700	
R23	3300Ω	½		BTS-3300	
R24	1000Ω	½		BTS-1000	
R25	10KΩ-5%	2	C25467-103	BTB-10K-5%	
R26	15KΩ-5%	2	C25467-153	BTB-15K-5%	
R27	16KΩ-5%	2		BTB-16K-5%	
R28	820Ω	1	C20070-821	BTA-820	
R29	470Ω	1	C20070-471	BTA-470	
R30	15KΩ	½	C22381-153		
R31	47Ω	½	C22381-470	BTS-47	
R32	1000Ω	½	C20061-102	BTS-1000	
R33	3300Ω	½	C20061-332	BTS-3300	
R34	150Ω	½	C20061-151	BTS-150	
R35	18KΩ-5%	½	C22382-183		
R36	47Ω	½	C22381-470	BTS-47	
R37	1000Ω	½	C20061-102	BTS-1000	
R38	3300Ω	½	C20061-332	BTS-3300	
R39	150Ω	½	C20061-151	BTS-150	
R40	1000Ω	½	C20061-102	BTS-1000	
R41	47Ω	½	C22381-470	BTS-47	
R42	1000Ω	½	C20061-102	BTS-1000	
R43	220KΩ	½	C22381-223	BTS-220K	
R44	120Ω	½	C22381-121	BTS-120	
R45	1000Ω	½	C20061-102	BTS-1000	
R46	150Ω	½	C20061-151	BTS-150	
R47	560KΩ	½	C22381-564	BTS-560K	
R48	220KΩ	½	C22381-224	BTS-220K	
R49	560KΩ	½	C22381-564	BTS-560K	
R50	220KΩ	½	C22381-224	BTS-220K	
R51	100KΩ	½	C22381-104	BTS-100K	
R52	3300Ω-5%	½	C22382-332	BTS-3300-5%	
R53	100Ω	½	C22381-101	BTS-100	
R54	220KΩ	½	C20061-224	BTS-220K	
R55	4700Ω	½	C22381-472	BTS-4700	
R56	1 Meg	½	C20061-105	BTS-1 Meg	
R57	150Ω	½	C22381-151	BTS-150	
R58	4700Ω-5%	2	C25467-472	BTB-4700-5%	
R59	10KΩ	½	C20061-103	BTS-10K	
R60	270KΩ	½	C22381-274	BTS-270K	
R61	220KΩ	½	C22381-224	BTS-220K	
R62	220KΩ	½	C22381-224	BTS-220K	
R63	220KΩ	½	C22381-224	BTS-220K	
R64	22KΩ	½	C22381-223	BTS-22K	
R65	100KΩ	½	C22381-104	BTS-100K	
R66	8200Ω	½	C22381-822	BTS-8200	
R67	120KΩ	½	C22381-124		
R68	150Ω	½	C20061-151	BTS-150	
R69	1000Ω	½	C22381-102	BTS-1000	
R70	680KΩ	½	C20061-684	BTS-680K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ARVIN PART No.	IRC PART No.	NOTES
R71	12KΩ	1	C20070-123	BTA-12K	
R72	22KΩ	1	C20070-223	BTA-22K	
R73	390Ω-5%	½	C22382-391	BTS-390-5%	
R74	47KΩ	½	C22381-473	BTS-47K	
R75	10KΩ-5%	½	C 22381-103	BTS-10K-5%	
R76	10KΩ-5%	½	C22381-103	BTS-10K-5%	
R77	10Meg	½	C20061-108	BTS-10Meg	
R78	150KΩ	½	C22381-154	BTS-150K	
R79	100KΩ	½	C22381-104	BTS-100K	Note 1
R80	1 Meg	½	C 22361-105	BTS-1 Meg	
R81	470Ω	1	C20070-471	BTA-470	
R82	2200Ω	2	C25238-222	BTB-2200	
R83	2.2Meg	½	C22381-225	BTS-2.2Meg	
R84	47KΩ	1	C20070-473	BTA-47K	
R85	22KΩ	½	C 22381-223	BTS-22K	
R86	270KΩ	½	C22381-274	BTS-270K	
R87	560KΩ	½	C22381-564	BTS-560K	
R88	47KΩ	½	C22381-473	BTS-47K	
R89	1100Ω-5%	½	C22382-112	BTS-1100-5%	
R90	4700Ω-5%	½	C 22382-472	BTS-4700-5%	
R91	820 Ω	½	C22381-821	BTS-820	
R92	1800Ω	½	C22381-182	BTS-1800	
R93A	22KΩ	½		BTS-22K	
B	8200Ω	½	◆C24166	BTS-8200	
C	8200Ω	½		BTS-8200	
R94	22KΩ	½	C22381-223	BTS-22K	
R95	470KΩ	½	C22381-474	BTS-470K	
R96	1.5Meg-5%	½	C22862-155	BTS-1.5Meg-5%	
R97	1.5Meg-5%	½	C22382-155	BTS-1.5Meg-5%	
R98	100KΩ	½	C 22381-104	BTS-100K	
R99	10Meg	½	C 22381-106	BTS-10Meg	
R100	1800Ω	2	C20802-182	BTB-1800	
R101	12KΩ-5%	½	C 22382-123	BTS-12K-5%	
R102	2.2Meg	½	C22381-225	BTS-2.2Meg	
R103	1500Ω	½	C 22381-152	BTS-1500	
R104	560Ω	½	C 22381-561	BTS-560	
R105	560Ω	½	C 22381-561	BTS-560	
R106	10KΩ	½	C 22381-103	BTS-10K	
R107	100KΩ-5%	½	C22382-104	BTS-100K-5%	
R108	100KΩ-5%	½	C 22382-104	BTS-100K-5%	
R109	4.7Meg	½	C 22381-475	BTS-4.7Meg	
R110	1 Meg	½	C 20061-105	BTS-1 Meg	
R111	1200Ω	½	C 22381-122	BTS-1200	
R112	8200Ω	1	C20070-822	BTA-8200	
R113	100KΩ-5%	½	C 22382-104	BTS-100K-5%	
R114	120KΩ	½	C 22381-124	BTS-120K	
R115	15KΩ	1	C 20070-153	BTA-15K	
R116	12KΩ	2	C20302-123	BTB-12K	
R117	8200Ω	½	C 22381-822	BTS-8200	
R118	470KΩ	½	C 22381-474	BTS-470K	
R119	47Ω	½	C 20061-470		
R120	50Ω	5	C 23970-6	1 3/4A-50	
R121	27KΩ	2	C20302-273	BTB-27K	
R122	27KΩ	2	C20302-273	BTB-27K	
R123	27KΩ	2	C20302-273	BTB-27K	
R124	3.9Ω	½	C20309-39		
R125	470KΩ	1	C20103-474		Note 2
R126	100Ω	30	C 40615		
R127	6800Ω	½	C 22381-682	BTS-6800	
R128	1800Ω	20	C 40616	2D-1850	
R129	220KΩ	½	C 20061-224	BTB-220K	
R130	100Ω	½		BTS-100	
R131	22Ω	½			Note 3

Note 1. Some Models may use a 47KΩ resistor in this application.
Note 2. Ch. TE330 uses three 220KΩ resistors in this application.
Note 3. Not used in all Models.
◆ Items R93A, R93B, R93C, C118A, C118B, C118C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ② 1.9A	670VCT .28ADC Tap ③ 230VAC .030ADC	5VAC ④ 3A	6.3VAC ② 1.2A SEC 4 6.3VAC ④ 8.3A	E-25698					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	190Ω	105Ω	C-22446-1	A-8122①	A-4003 HVO-9 ②	TBO-3 ① TFB-13	A-97Y D-19	208T9 226T1 ④	Vert. Osc. Trans. Horiz. Output Trans.
T3	4370Tap ② 20Ω	361Tap ② 11.7Ω,3i.7Ω SEC 2 0Ω	E-24989						
T4	1560Ω Tap @ 4.2Ω		C-24990-1	A-8141	A-3039	TSO-12	A-104X	226T1	Vert. Output Trans.
T5A	24Ω		D-24807	DY-11A ③		TY-7 ⑤	Y-19 ③		Horiz. Deflection Coils.
B	46Ω								Vert. Deflection Coils.
T6	14Ω	18Ω	C-40027						Width & AFC Coil.

① Drill one new mounting hole .
② Do not connect term #7 to term #8.
③ Use original horiz. deflection coil network.
④ See instruction sheet packed with unit for terminal connection.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T7	5.6KΩ	3.4Ω	504Ω	.79Ω	C-24776-1	A-3849	A-3019	RO-9 ①	S-3X ①	①Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ARVIN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3.4Ω	C-25627 D-23405 ① D-25519 ②	8T-105 Mod. P5-X	5A07	① 6" PM Speaker ② 10" PM Speaker used on Model 6215CB-UHF

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ~/	REPLACEMENT DATA ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.130ADC	120Ω	2.2 Hy.	C-23087-1		C-2994	TR-1515	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L2	UHF Ant. Mixer Grid & Osc. Coils	0Ω						
L3	UHF Ant. Coil End Inductor	0Ω						
L4	UHF Mixer Grid Coil End Inductor	0Ω						
L5	UHF Osc.Coil End Inductor	0Ω						
L6	Parasitic Choke	0Ω						Wound on 330Ω resistor
L7	Fil. Choke	0Ω						Wound on 330Ω resistor
L8	Fil. Choke	0Ω						
L9	Cathode Choke	0Ω						
L10	RF Choke	0Ω						
L11	UHF IF Coupling Coil	0Ω						
L12	UHF IF Input Coil	0Ω						Tapped
L13	Feedback Coil	0Ω						
L14	Fil. Choke	0Ω						
L15	Fil. Choke	0Ω						
L16	127MC IF Output Coil	0Ω						Includes 15KΩ resistor, two 8.2MMF capacitors and 15MMF capacitor
L17	UHF 127MC IF Trans.	0Ω CT	0Ω					
L18	VHF Ant. Trans.	0Ω CT	0Ω					Low Channel Secondary -0Ω
L19	Ant. Coils	0Ω						Channel 13
L20	Ant. Coil	0Ω						.56 Microhenries
L21	Fil. Choke	.2Ω						(IRC part #CL-1)
L22	Neutr.Coil	0Ω						Channel 13
L23	RF Coil	0Ω						
L24	RF Coils	0Ω						
L25	Mixer Grid Coil	0Ω						Channel 13
L26	Mixer Grid Coils	0Ω						
L27	Fil. Choke	0Ω						
L28	Osc.Plate Coil	0Ω CT						Channel 13
L29	Osc.Coils	0Ω						Channel 6
L30	Osc. Coil	0Ω						
L31	Conv.Plate	0Ω						
L32	1st.Video IF	.1Ω		C25410	17-4500			Includes Trap
L33	Fil. Choke	0Ω		A23095			4604	1.5 Microhenries
L34	2nd.Video IF	.1Ω		C25411	17-4501			Includes Trap
L35	3rd.Video IF	.1Ω		C25412	17-4502			Includes Trap
L36	RF Choke	1.6Ω		D22500-19		TV-130 †	4626 †	30 Microhenries, wound on 18KΩ resistor

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (CONT.)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L37	Fil. Choke	0Ω		A23095			4604	1.5 Microhenries
L38	4th. Video IF	.1Ω		C25413	17-4503			Includes Trap
L39	RF Choke	1.6Ω		D22500-19		TV-180 †	4626 † 6219	20 Microhenries, wound on 18KΩ resistor
L40	Cathode Trap	0Ω	0Ω	C25415	20-1045			
L41	5th. Video IF	.1Ω		C254747	17-4504			Includes Trap
L42	RF Choke	2Ω		D22500-8		TV-180 ■	4624 ■	20 Microhenries, wound on 12KΩ resistor
L43	Series Peaking Coil	2.5Ω		D25468-6	19-3036	TV-180	6176	40 Microhenries
L44	Shunt Peaking Coil	3.7Ω		D25468-5	19-3093	TV-181	6177	100 Microhenries
L45	Series Peaking Coil	.2Ω		A25916	19-3001	TV-189	6175	1.7 Microhenries
L46	Series Peaking Coil	7.3Ω		D25468-8	19-3250 ▲	TV-185 ▲	6181 ▲	250 Microhenries, wound on 16KΩ resistor
L47	4.5MC Trap	1Ω		C25609	20-1004	TV-151	1470	
L48	Shunt Peaking Coil	6.2Ω		D25468-1	19-3180	TV-184	6180	185 Microhenries
L49	Sound IF	1.6Ω		C25543	17-1031	TV-113 ◓	1470A ‡	
L50	Ratio Det.	3.8Ω	.3ΩCT	C25322	17-1033	TV-110	1468	Tertiary Winding -1.05Ω
L51	Horiz. Osc.	60Ω		C23449	19-1576	TV-163	6210	

■ Parallel with 12KΩ resistor
▲ Parallel with 16KΩ resistor
‡ Add 30MMF capacitor externally
◓ Detune unused section and use adaptor plate
† Parallel with 18KΩ resistor

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA ARVIN PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.030	A-25697	NA5	8J1	1214B	6S35	35
M2	.030	A-25697	NA 5	8J1	1214B	6S35	35

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ARVIN PART No. FUSE	ARVIN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	3AG-P/T	1/4A 250V	A-22493		318.250 (3AG-¼A-P/T)		GJV-1/4	
M4	3AG-P/T	1/2A 250V	A-40656		318.500 (3AG-½A-P/T)		GJV-1/2	

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M5	Pilot Light	A19351	Type #47
M6	RF Tuner	AE25267-4	UHF And VHF Assy.
M7	Band Elimination Filter	C-40364	Band Elimination (UHF Ant.) (Not used in all Models)
M8	Band Elimination Filter	C-40364	Band Elimination (VHF Ant.) (Not used in all Models)
M9	Trap	C-25963	IF-FM Trap Assy. (Not used in Ch. TE332-1)
M10	Crystal Diode		UHF Converter (IN72)
M11	Switch	A-25525	Local-Distance
M12	Centering Magnet	D-25626	
M13	Ion Trap	C-25662-1	
B2	Trimmer Capacitor	A-24528	Horiz. Drive, 40-370MMF
	Retainer Rail	E-25732	Model 6213TM, 2615CM
	Retainer Rail	E-25732-2	Model 6215CB, 6213TB
	Control Door Assy.	AD-25913-5	Model 6173TM
	Control Door Assy.	AE-40169-1	Mahogany
	Control Door Assy.	AE-40169-2	Blonde
	Safety Glass	E-25537	Model 6173TM
	Safety Glass	E-24947	6213TB, 6213TM, 6215CB, 6215CM Models
	Mask	E-40450-1	Model 6173TM
	Mask	R-40382	Models 6213TB, 6213TM, 6215CB, 6215CM
	Knob	D-25077-1	Channel Indicator
	Knob	D-25077-3	Channel Indicator, Blonde
	Knob	D-25736-1	Volume
	Knob	D-25736-3	Volume, Blonde
	Knob	C-25735-1	Contrast
	Knob	C-25735-3	Contrast, Blonde
	Knob	C-25094-1	Fine Tuning & UHF
	Knob	C-25094-3	Fine Tuning & UHF, Blonde
	Knob	C-24699-2	Behind Control
	Knob	C-24699-3	Behind Control Door, Models 6213TB, 6213TM, 6215CB, 6215CM
	UHF Indicator Disc	C-25095	

TROUBLE SHOOTING AIDS (CONT.)

VIDEO

SOUND BARS

Check adjustment of 4.5MC Trap (A16). Check local oscillator adjustment and video IF alignment.

POOR RESOLUTION

Check video IF alignment. If alignment cannot be brought within tolerance, substitute video IF tubes and check circuit components.

SMEAR

Substitute V9 and V10. Check associated components, particularly the peaking coils.

ONE WIDE BLACK BAR

Check tuner, Video IF, detector and video amplifier tubes for heater to cathode leakage.

POOR CONTRAST

Check signal at W2;

If Insufficient	If Sufficient
Substitute IF and Video amplifier tubes. Check associated components.	Check picture tube and grid circuit components.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V11, V12, V13 and V14. Check alignment of ratio detector and sound IF stages. Check video IF alignment.

BUZZ

Adjust ratio detector secondary for minimum buzz. If still noticeable, substitute V12 and readjust.

DISTORTED

Check audio amplifier stages V13 and V14 using audio signal generator and scope;

If Undistorted	If Distorted
Check adjustment of ratio detector and sound IF stages. Check video IF alignement.	Check components of amplifier stage where distortion occurs.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution, V19, V20, V21 and V22. Check 1/4 Amp fuse located in high voltage cage.

Check waveform at W13;

If Unsatisfactory	If Satisfactory
Check components of horizontal oscillator.	Check T3, T5A, T6 and other components of horizontal output stage. Check high voltage filter network.

WEAK HIGH VOLTAGE

Substitution V19, V20, V21, V22 and V23. Follow procedure outlined under loss of high voltage.

BLOOMING

Substitute V20, V21, V22 and V23. Check high voltage filter. Check picture tube.

POWER

DIM PICTURE

Measure B plus;

If Low	If Normal
Check for shorts or leaky capacitors.	Check boost B plus circuit. Check picture tube.

SMALL RASTER, WEAK SOUND

Substitute V23. Check B plug circuit for shorts. Check line voltage.

GENERAL

NO PICTURE, NO SOUND, NO SNOW

Check by substitution V3, V4, V7, V8 and V9. Check associated components.

WEAK PICTURE, NO SOUND

Substitute V5 and V6. Check associated components.

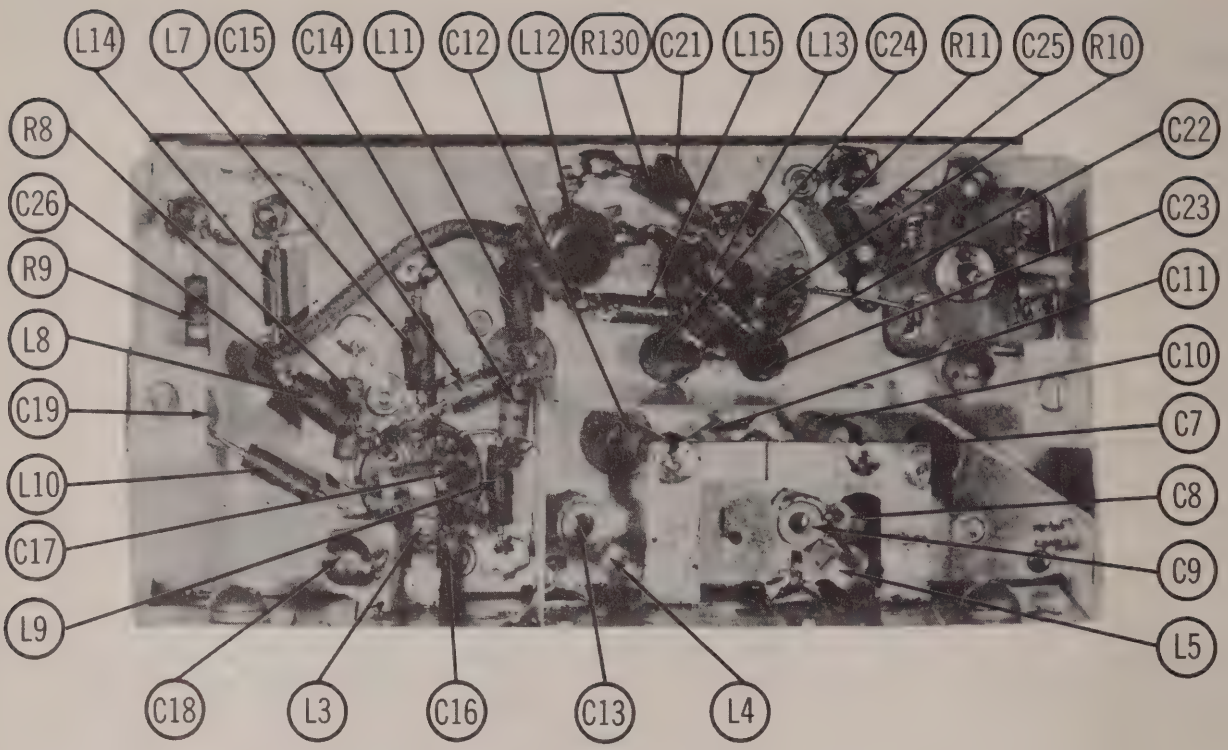
SOUND BUT NO PICTURE

Substitute V10 and check components.

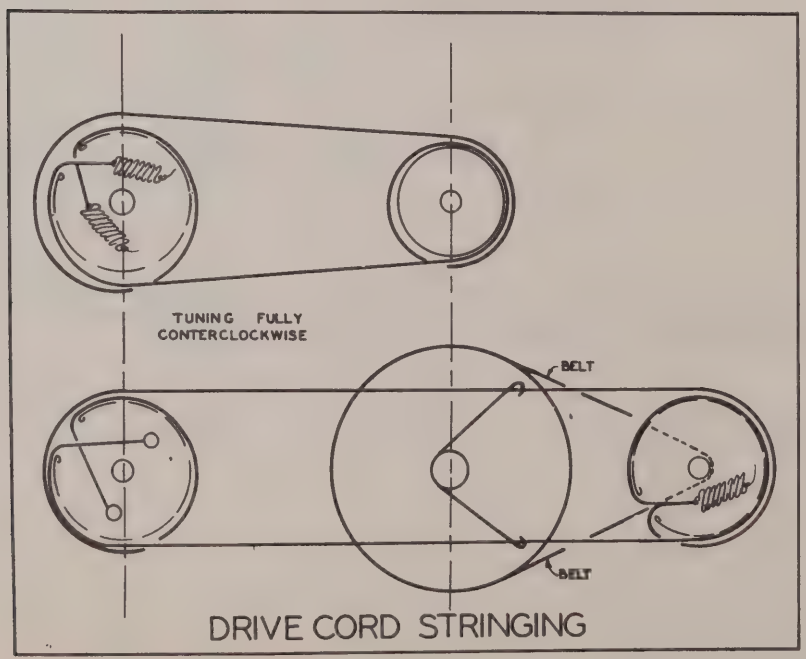
INTERMITTANT STREAKS.

Check high voltage circuit for corona discharge and arcing.

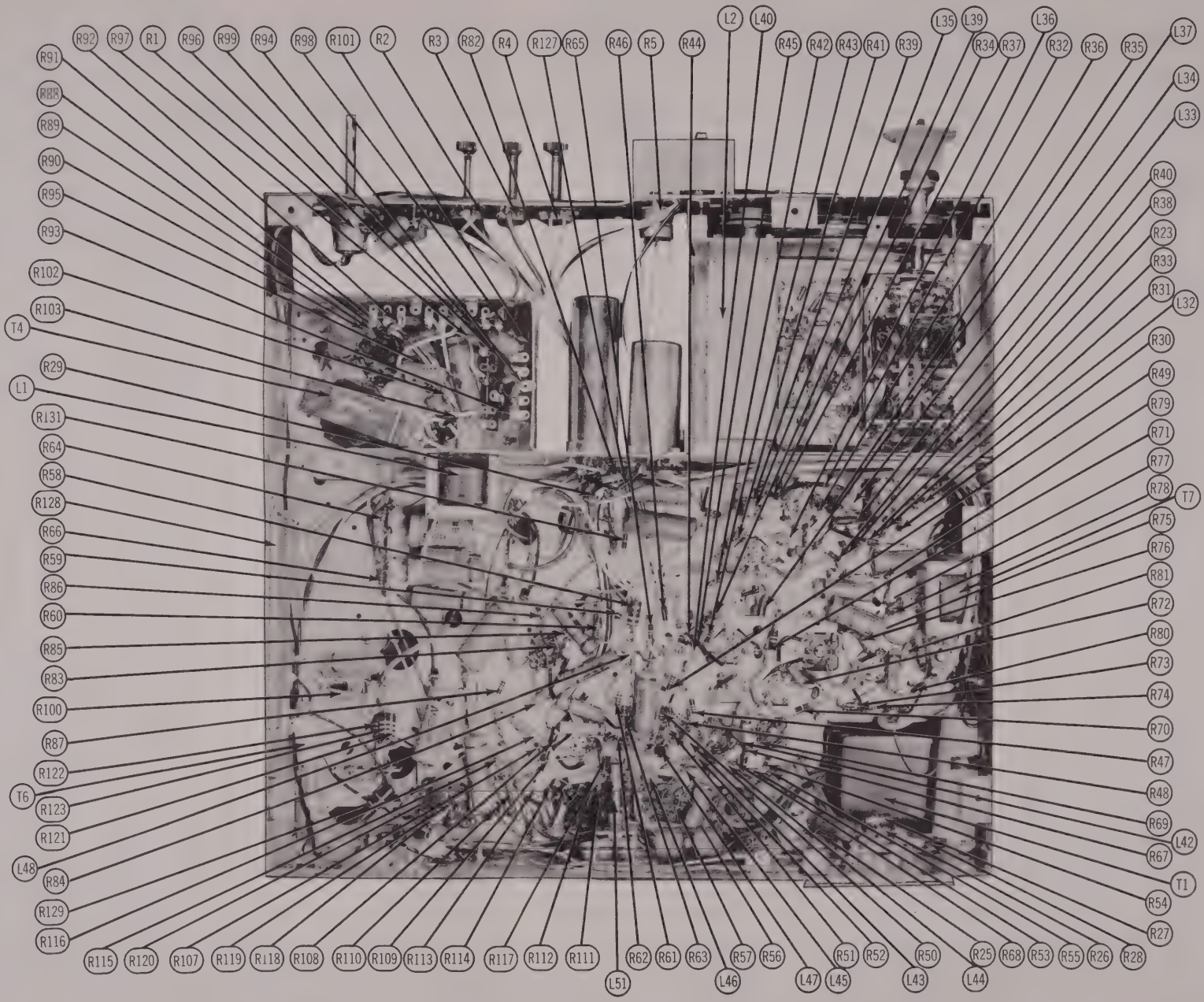
The Trouble-Shooting photographs shown above are made with permission of transmitting station WFBM-TV and in no way reflect the quality of the transmitted picture. Similarly, symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.



UHF TUNER-BOTTOM VIEW



DRIVE CORD STRINGING



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may accomplished by removing the Channel Selector and Fine Tuning knobs.

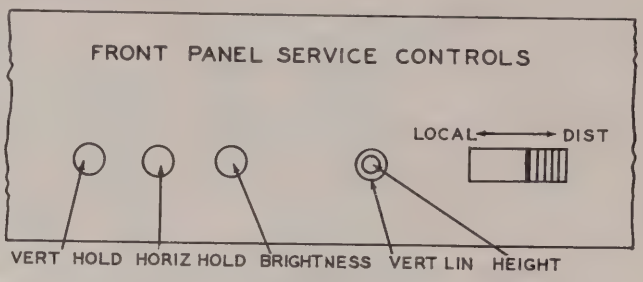
PICTURE TUBE SAFETY GLASS CLEANING

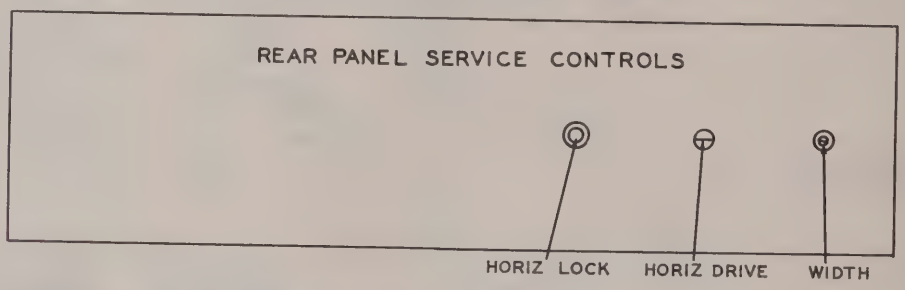
To clean safety glass remove 3 wood screws holding metal strip at top of safety glass. Remove strip and safety glass. Use extreme caution when removing safety glass .

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the Mid-position of its range and adjust the Horiz. Lock slug until the picture synchronizes horizontally. If synchronization cannot be obtained by the above adjustment see HORIZ. SWEEP CIRCUIT ADJUSTMENTS on page 11.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L50, located on top of chassis. (See tube placement chart).

FUSES

Two fuses are used. One for Horizontal Sweep Circuit protection and one for UHF Tuner B± protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanical by adjusting a magnetic ring around the neck of picture tube located flush against the yoke. Turn the knurled knob and at the same time rotate the ring around the tube untill picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 3 push on type control knobs. Remove fine tuning knob.
2. Remove "C" clamp, knob & spring.
3. Disconnect built-in antenna. (Built - in antenna fastened to rear cover).
4. Remove 6 wood screws & 1 metal screw. Remove rear cover.
5. Disconnect yoke plug (Remove 1 screw), CRT socket, HV lead.
6. Disconnect speaker. Remove 4 speaker nuts. Remove speaker. (Not necessary for chassis removal).
7. Remove 6 chassis bolts. Remove chassis.

PROPERTY OF
L. F. BLANKENSHIP
3994 MEADE ST
DENVER, COLORADO

EMERSON MODELS
705A, B (Ch. 120155A, B)

EMERSON MODELS
705A, B (Ch. 120155A, B)

TRADE NAME	Emerson Models 705A, B (Ch. 120155A, B)
MANUFACTURER	Emerson Radio & Phono Corp., 111 Eighth Ave., New York, N.Y.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.- AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY RATING	110-120 Volts AC/DC (or) 1.5 Volts "A" Supply & 67.5 Volts "B" Supply 12 Amp. @ 117 Volts AC (or) 250MA @ 1.5 Volts DC & 8MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Batteries should be in normal position during steps 2, 3 and 4 if battery power is used during alignment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	540KC	Tuning gang fully closed	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1620KC	Tuning gang fully open	"	A6	"
4.		"	1400KC	Tune to 1400KC signal	"	A7	"

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	Converter	810110	1R5	7AT	
V2	IF Amplifier	800017	1U4	6AR	
V3	Det-AVC-AF Amp.	800019	1U5	6BW	
V4	Audio Output	800018	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	925227						R1347	Red
B	30	150								Green
C	300	15								Yellow
C2	.047	400	920555	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C3	.01	200	920553	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C4	3.3		915032	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCV-V33	
C5	.003	200	920552	SI3000	D6-302		GP2-333-302	UC-523	5HK-D3	
C6	100		928013	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C7A	200									
B	.001									
C	100		928034						34C8	
D	.01									
E	.001									
C8	.002	400	920551	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	
C9	.1	400	920556	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C10	.05	200	920554	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C11	.047	400	922554	489ZX-05		PJ4147		PT4147	4TM-S47	
C12	.05	400	920555	P488-05		PTE4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1 Meg	½	390214					Volume & Switch

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	NOTES
R2	100KΩ	½	350972	BTS-100K	
R3	15KΩ	½	340772	BTS-15K	
R4	4.7Meg	½	351372	BTS-4.7Meg	
R5	3.3Meg	½	351332	BTS-3.3Meg	
R6	10Meg	½	351452	BTS-10Meg	
R7	47KΩ	½	340892	BTS-47K	
R8	10Meg	½	351452	BTS-10Meg	
R9	4.7Meg	½	351372	BTS-4.7Meg	
R10	1 Meg	½	341212	BTS-1 Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	NOTES
R11	3.3Meg	½	351332	BTS-3.3Meg	
R12	470Ω	½	340412	BTS-470	
R13	1200Ω	½	340512	BTS-1200	
R14	680Ω	½	340452	BTS-680	
R15	680Ω	½	340452	BTS-680	
R16	120Ω	3	394018		
R17	2200Ω	8	394134	1 3/4A -2250	
R18	1500Ω	1		BTA-1500	

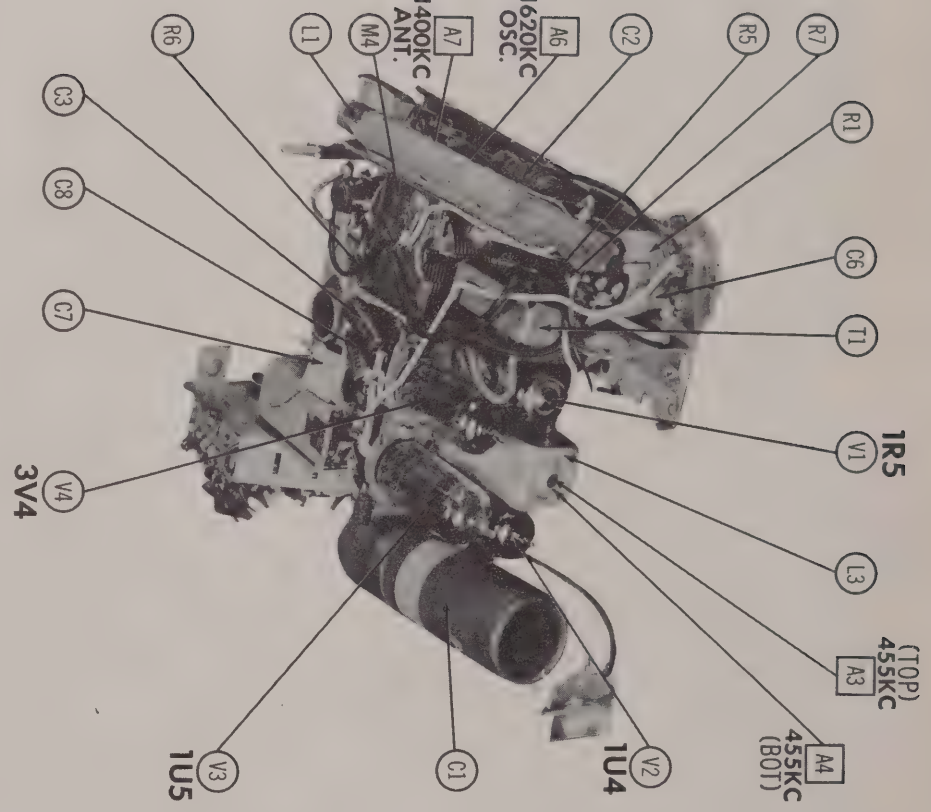
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	9KΩ	3.5Ω	420Ω	.12Ω	734076	A-3329	A-2927 ①		S-11X	① Drill one new mounting hole .

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: EMERSON PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	3½"	PM	3.5Ω	180085 180092 ①	35J4	3A07	① Alternate 3½" PM speaker.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	.6Ω		700074				
L2	Osc. Coil	.8Ω	8Ω	716072	14-1073			
L3	Input IF	22Ω	22Ω	720152	13-6758	BC-352	12-C1	
L4	Output IF	22Ω	22Ω	720152	13-6753	BC-353	12-C2	

SELENIUM RECTIFIER

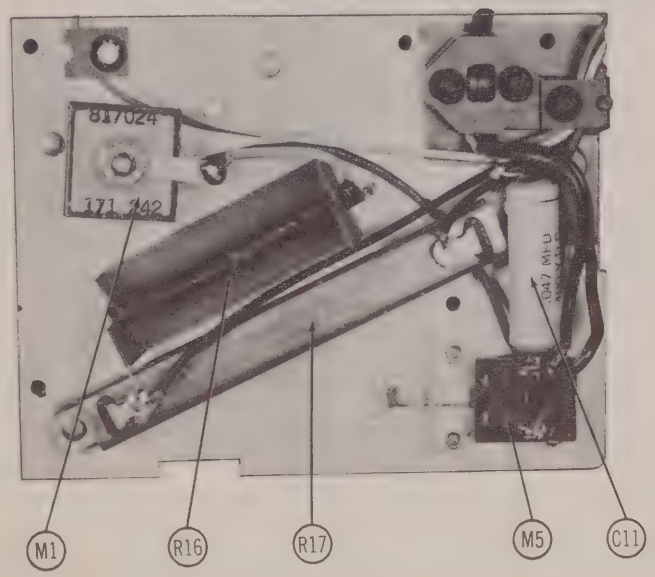
ITEM No.	RATING: CURRENT	REPLACEMENT DATA: EMERSON PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.060	817024		8J1			65

BATTERIES

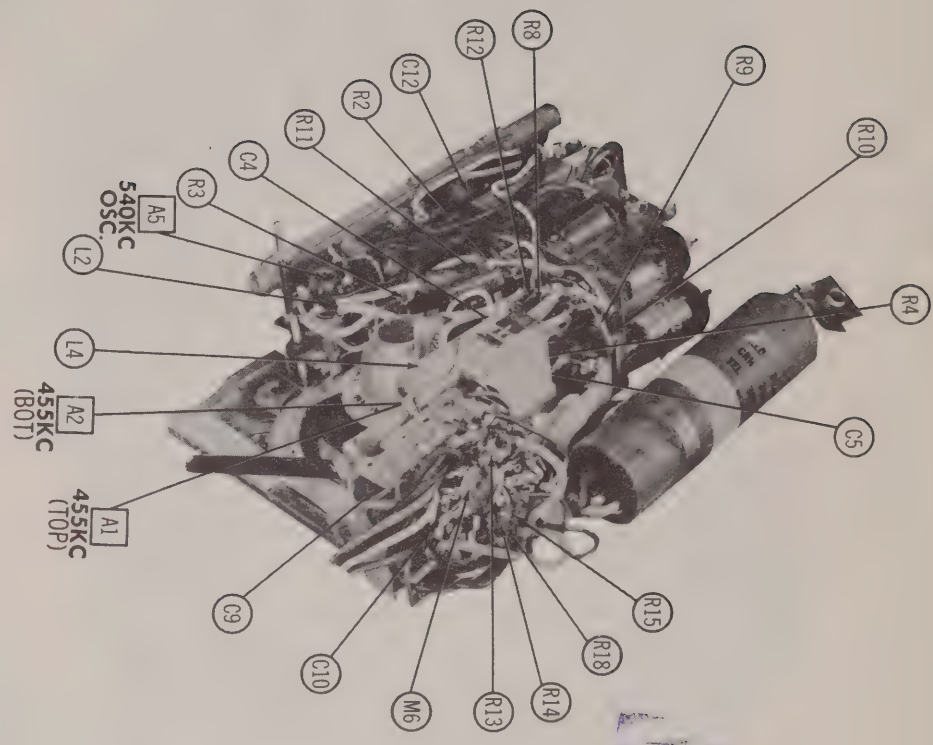
ITEM No.	VOLTAGE	EMERSON PART No.	REPLACEMENT DATA: EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	1.5	EM236	964			2IR			(2 Used)
M3	67.5	EM216		477			P45		

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M4	Tuning Capacitor	900088	15-213MMF, 13-110MMF
M5	Switch	510093	Interlock
M6	Switch	510092	Power Transfer
	Cabinet		Specify Color
	Cabinet Front		Specify Color
	Back		Specify Color
	Handle		Specify Color
	Dial Assy.	460357	Ebony & Gold
	Dial Assy.	460365	Saddle Tan & Gold
	Dial Assy.	460374	French Grey & Gold
	Knob	450139	Volume



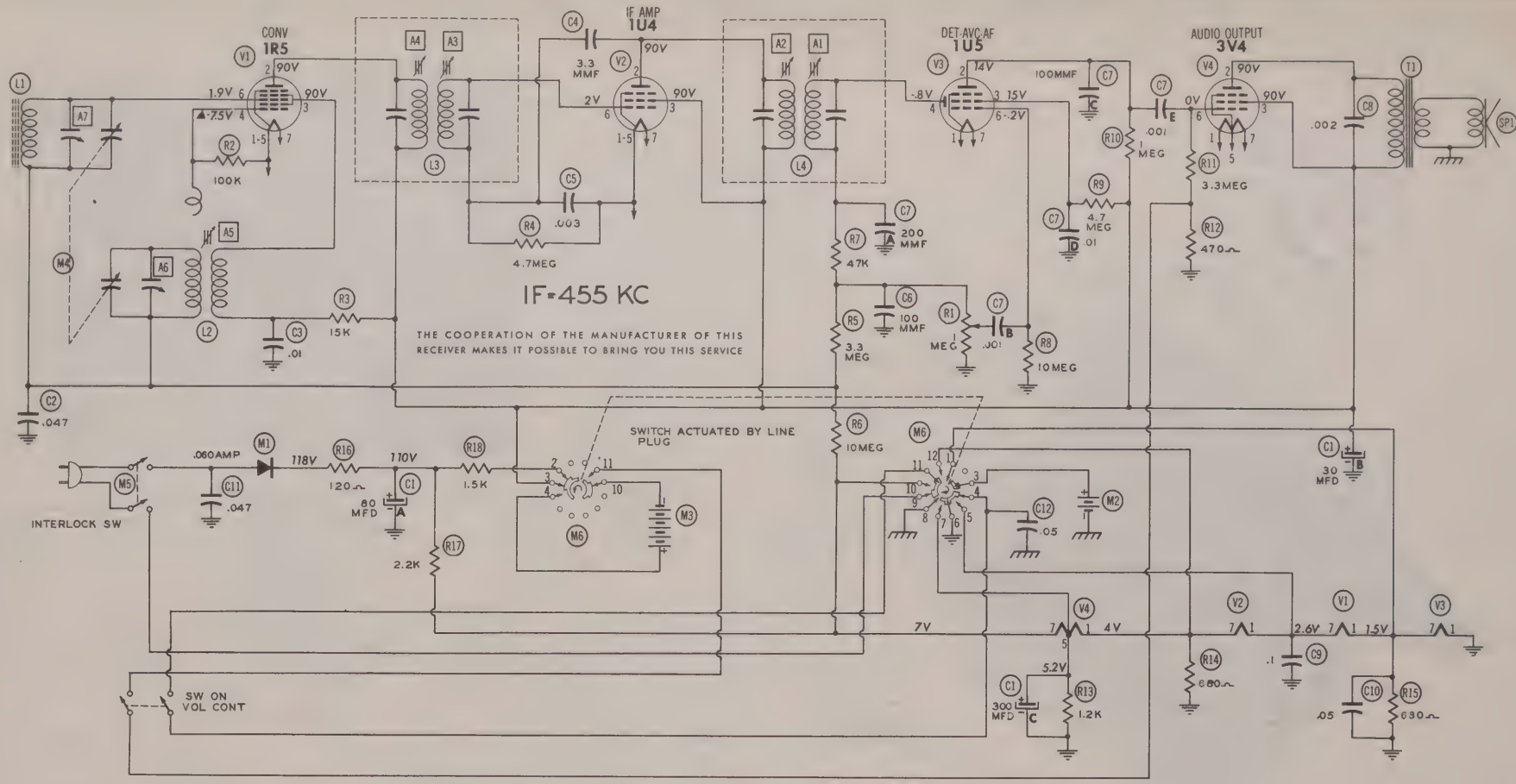
CHASSIS—BOTTOM VIEW



L. F. Electronics Co.
3934 Addison
Denver, Colorado

EMERSON
MODEL 705A (Ch. 120155A)

EMERSON
MODEL 705A (Ch. 120155A)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†1.6KΩ	†16KΩ	100KΩ	*	4Meg	*
V 2	1U4	*	†1.6KΩ	†1.6KΩ	†1.6KΩ	*	4.7Meg	*
V 3	1U5	* —	†1 Meg	†4.7Meg	1 Meg	12KΩ	10Meg	*
V 4	3V4	*	†1.6KΩ	†1.6KΩ	420Ω	*	3.3Meg	*

† MEASURED FROM OUTPUT OF M1
▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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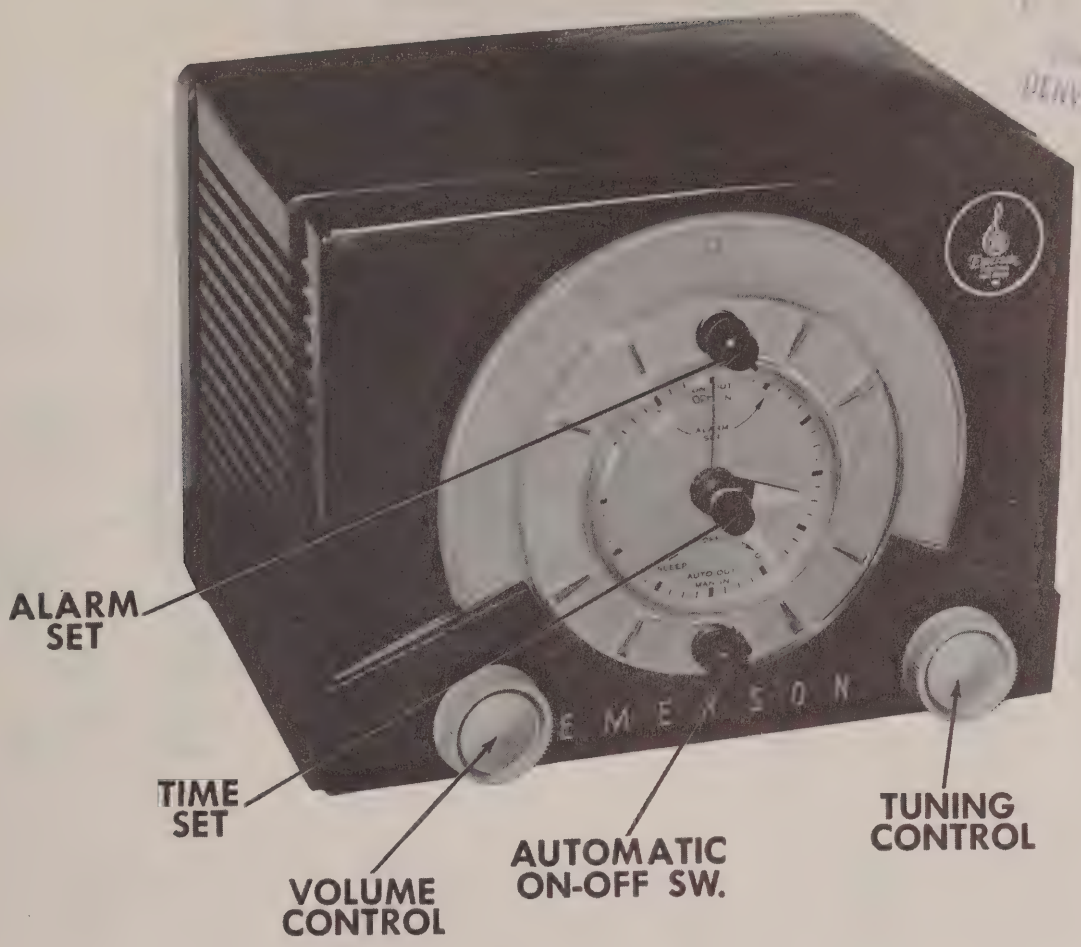
208-4

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

EMERSON MODEL
724B (Ch. 120151B)



EMERSON MODEL
724B (Ch. 120151B)

TRADE NAME	Emerson Model 724B (Ch. 120151B)
MANUFACTURER	Emerson Radio & Phono Corp., 111 Eighth Ave., New York, N.Y.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING .26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001 MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.	Direct	High side to external antenna lead. Low side to B-.	1400KC	Tune to 1400KC signal	"	A6	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

EMERSON
MODEL 725B (Ch. 120151B)

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		EMERSON PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	925231	PRS150/50-30		EDL5315		2N520	TVA-2450	Red Green
B	30	150								
C2	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3A	220				♦PC-150		♦1408-01		♦103C4	
B	.002									
C	.005									
D, E	250									
C4	.02	400		P488-02	DD-203	PTE4S2		PT412	4TM-S2	
C5	.05	400		P488-05		PTE4S5		PT415	4TM-S5	
C6	.05	400		P488-05		PTE4S5		PT415	4TM-S5	

♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B, R5C are combined in one unit.
When replacing items separately C3D and C3E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	390212	Q11-133	AG-58-S	AB-59	U-50	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	120Ω	½		BTS-120	
R4	3.3Meg	½		BTS-3.3Meg	
R5A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½	♦	BTS-470K	
C	470KΩ	½		BTS-470K	

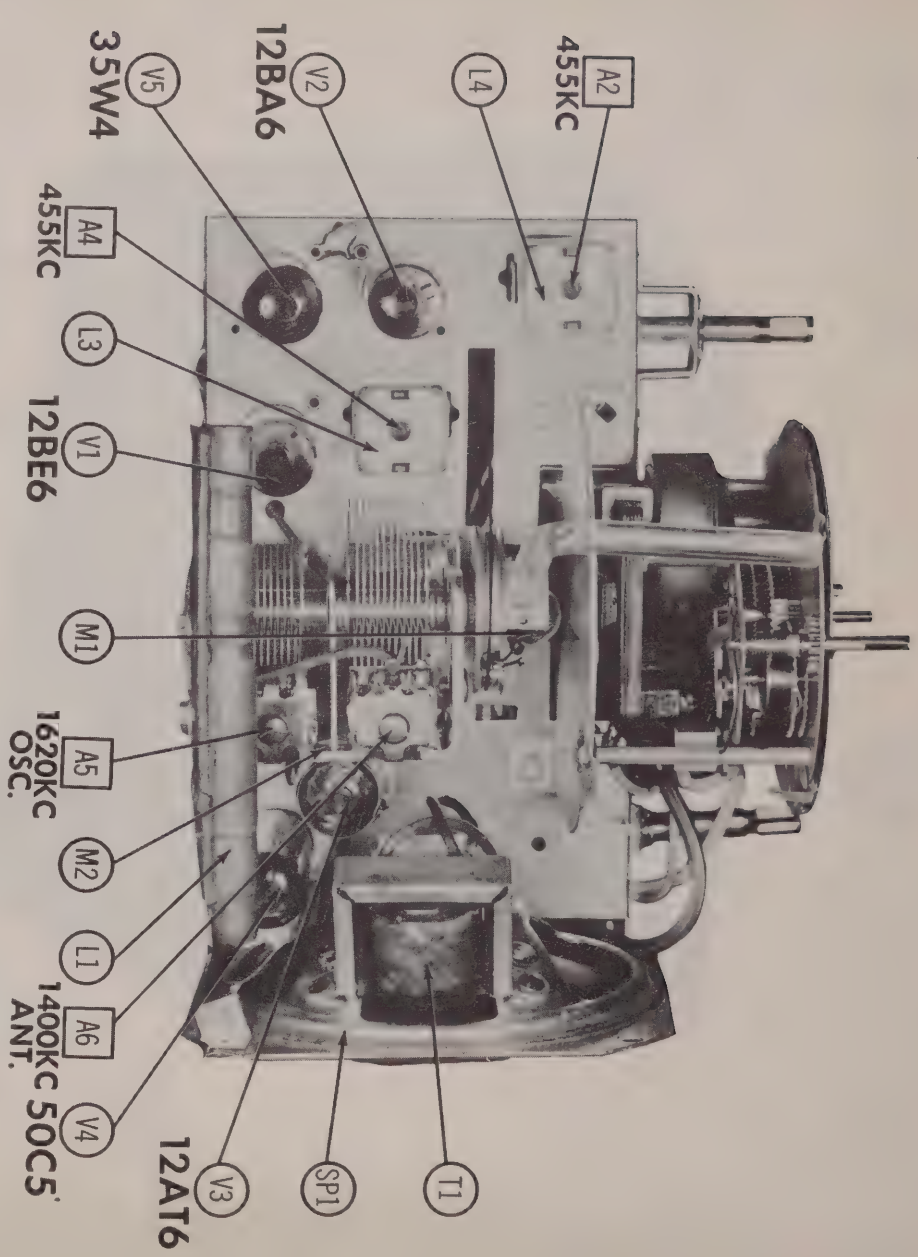
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R6	10KΩ	½		BTS-10K	
R7	150Ω	½		BTS-150	
R8	18Ω	½			
R9	1500Ω	1		BTA-1500	

♦ Items R5A, R5B, R5C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	2KΩ	3.3Ω	178Ω	.86Ω		A-3332	A-3025			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	180089	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

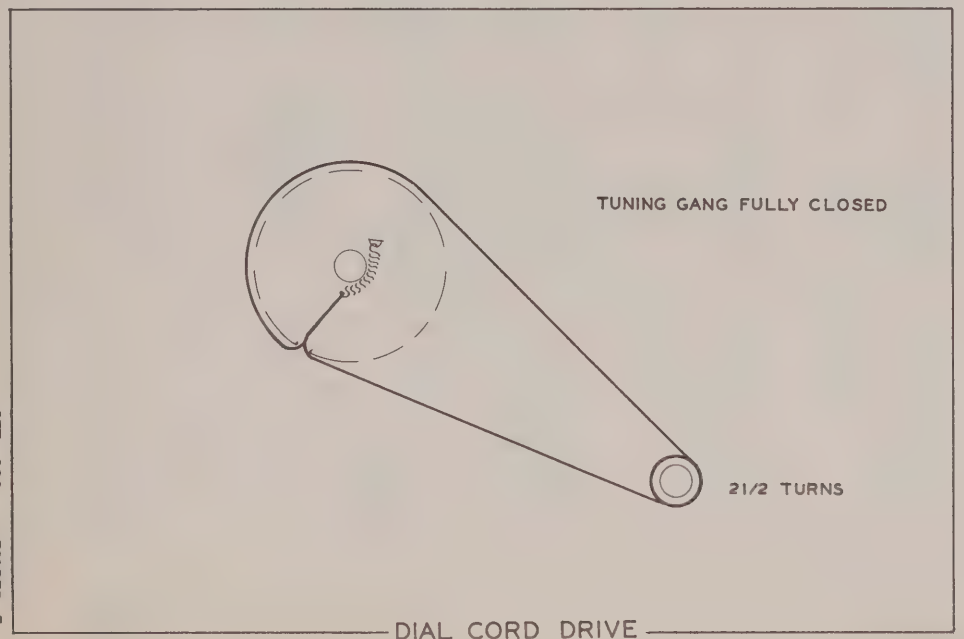
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	0Ω	.6Ω					
L2	Osc. Coil	.7Ω	6.5Ω		14-1073			
L3	Input IF	17.5Ω	17.5Ω	720033	16-6758	BC-352	12-C1	
L4	Output IF	17.5Ω	17.5Ω	720033	16-6758	BC-353	12-C2	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					EMERSON PART No.		
M1	Bayonet	6-8	.15	Brown			Type #47

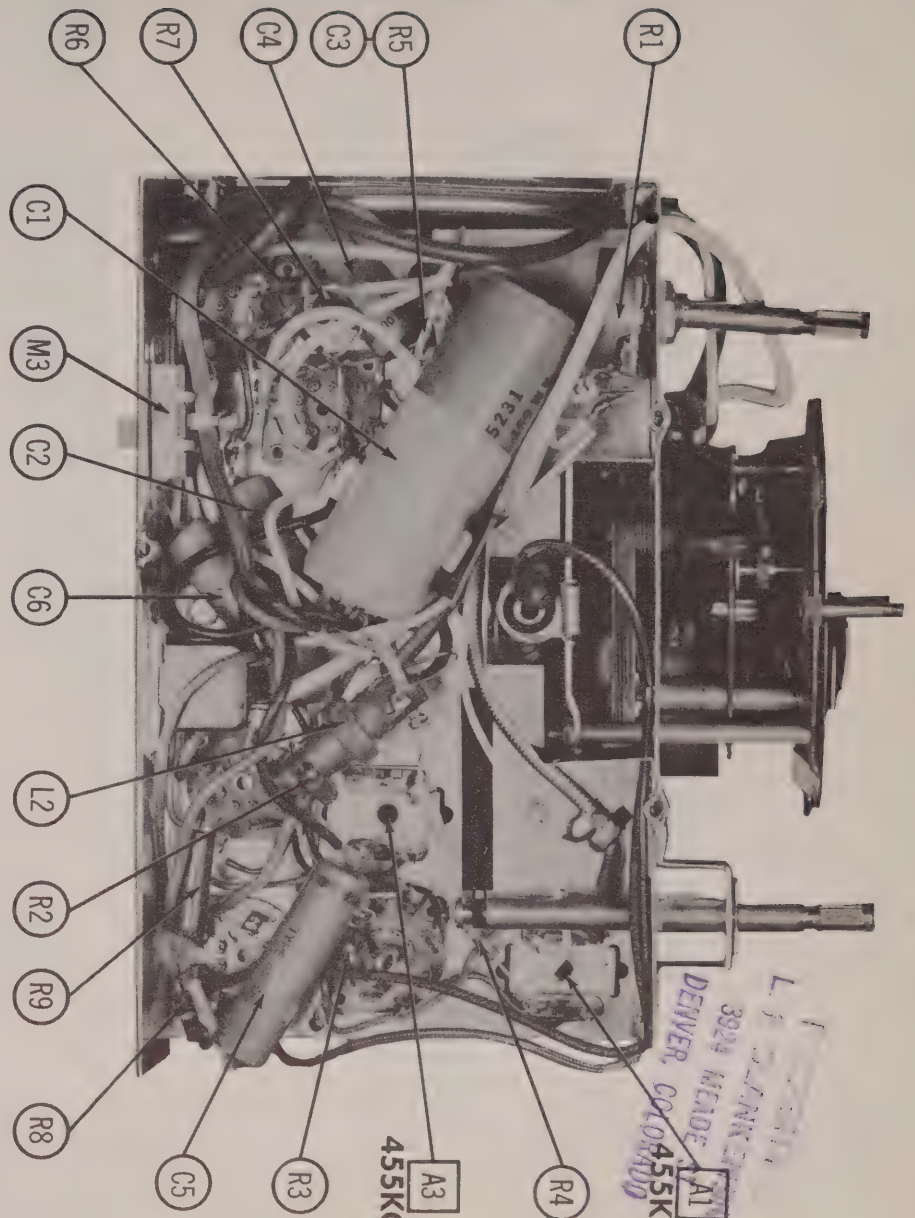
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M2	Tuning Capacitor	900089	32-395MMF, 32-180MMF
M3	Switch		Off/On (Radio)



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



L. F. RADIO
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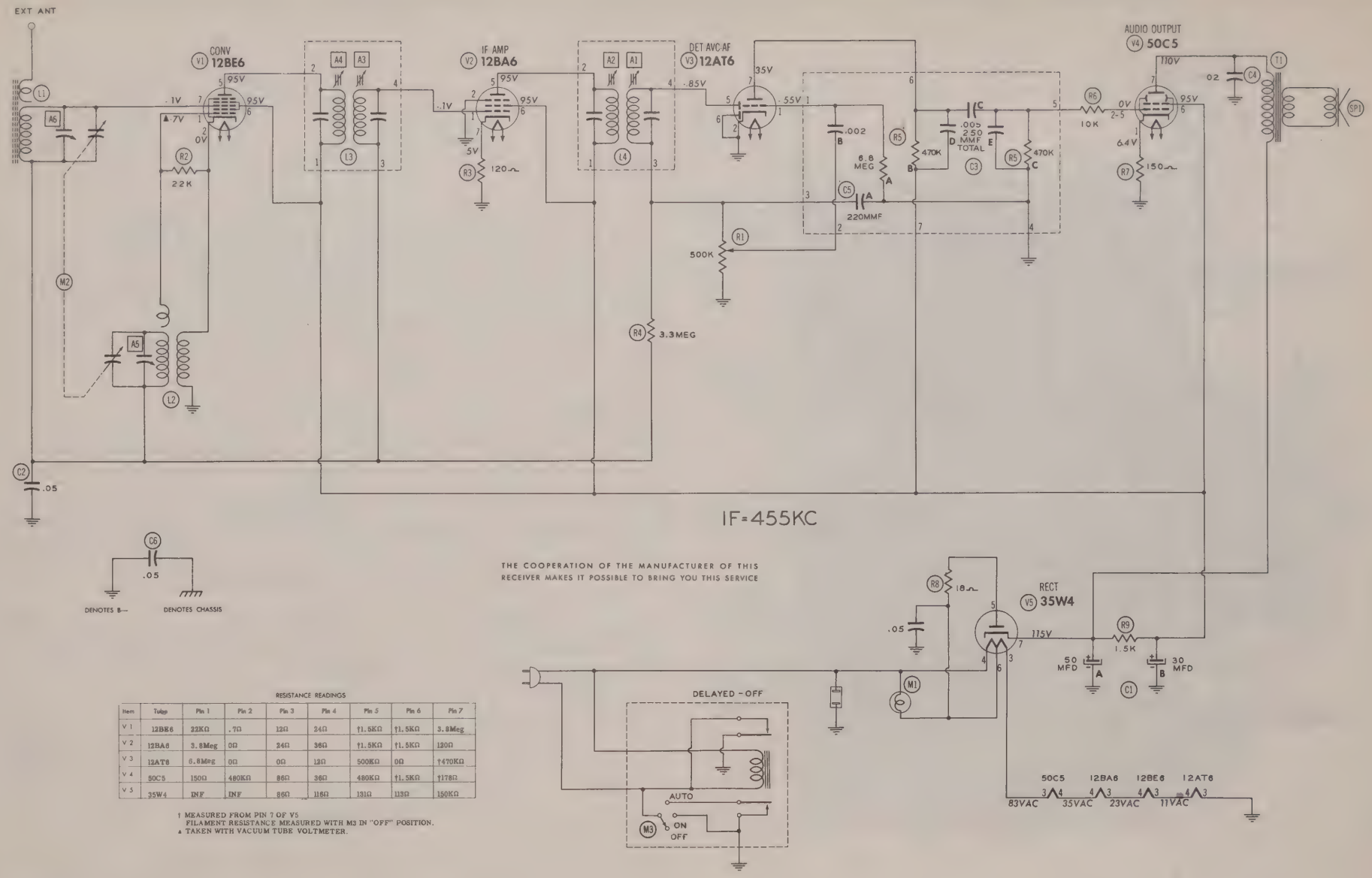
EMERSON
MODEL 724B (Ch. 120151B)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.7Ω	12Ω	24Ω	†1.5KΩ	†1.5KΩ	3.8Meg
V 2	12BA6	3.8Meg	0Ω	24Ω	36Ω	†1.5KΩ	†1.5KΩ	120Ω
V 3	12AT6	6.8Meg	0Ω	0Ω	12Ω	500KΩ	0Ω	†470KΩ
V 4	50C5	150Ω	480KΩ	86Ω	36Ω	480KΩ	†1.5KΩ	†178Ω
V 5	35W4	INF	INF	86Ω	116Ω	131Ω	113Ω	150KΩ

† MEASURED FROM PIN 7 OF V5
FILAMENT RESISTANCE MEASURED WITH M3 IN "OFF" POSITION.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

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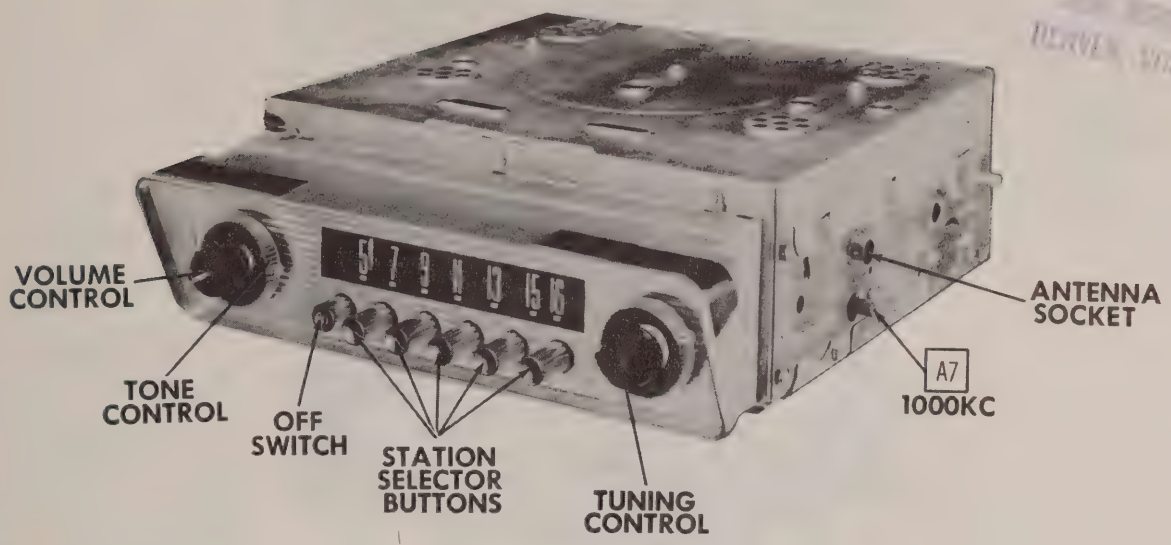
208-5

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

FORD MODEL
FAD-18805-D (3SF755)



TRADE NAME	Ford Model FAD-18805-D (3SF755) (For 1953 Ford Automobile)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & TV Div., 254 Rano St., Buffalo, 7, N.Y.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Receiver
TUBES (Eight)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AV6 Det-AF Amp., 6AV6 AVC-Phase Inv., (2) 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.8 Amp @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Receiver can be aligned without removal of top and bottom covers. Holes are provided for access to all alignment points.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	265KC (400% Mod)	Point of non-interference.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. Repeat adjustment until no further increase in output is noted.
2.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	Turn to high frequency stop.	"	A5, A6, A7	Adjust in order given for maximum output.
	Turn to 1500KC or 1600KC signal and check pointer calibration, adjusting the pointer calibration screw, if necessary, to set pointer correctly. The following adjustments should not be necessary unless coils or cores have been replaced or tampered with.						
3.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	Tune to high frequency stop.	Across voice coil.	A5, A6, A7	Adjust in order given for maximum output.
4.	"	"	1000KC	1000KC	"	A8, A9, A10	Adjust in order given for maximum output. Repeat steps 3 and 4 for correct tracking and calibration.
	Install receiver in car, extend antenna to maximum height and allow receiver to operate for approximately 15 minutes to reach normal operating temperature. Tune in a weak signal near 100KC and peak A7 for maximum volume.						

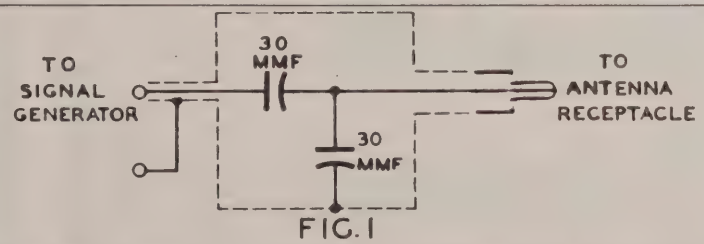


FIG. 1

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7BK	
V4	Det.-AF Amplifier	6AV6	6AV6	7BT	
V5	AVC-Phase Inv.	6AV6	6AV6	7BT	
V6	Audio Output	6AQ5	6AQ5	7BZ	
V7	Audio Output	6AQ5	6AQ5	7BZ	
V8	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	350	161-3005	AFH3-107		C080		FP345.8	TVL-3678	
B	▲20	350								
C	20	25								
C2	10000	●	168-0002D	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C3	150	500	164-0150			5R5T15		MCB236		
C4	.047	200	160-02147	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C5	.1	400	160-0401	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C6	33		163-0033	BPD-000033	D6-330		GP1K-330	UC-5433	5GA-Q33	
C7	18	500	164-0018	1469-00002		5R5Q2			MS-42	
C8	230		165-0230A							
C9	.1	200	160-0201	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C10	10	500	164-0010	1468-00001	D6-100	5W5Q1	GP1K-100	MC215	1FM-45	
C11	.015	400	160-06115	P488-015		PTE6S15		TP400	6TM-S15	
C12	.0056	400	160-04256							
C13	220	500	163-0220	1468-00025	D6-221	5W5T25	GP2K-221		1FM-325	
C14	.0047	400	160-04247	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C15	.022	400	160-06122	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C16	10000		168-0002D	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C17	220	500	163-0220	1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C18	.022	400	160-06122	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C19	.0082	1600	160-16282							
C20	.5	100	169-0001	P185-5		MP2P5			68P20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1.5Meg	½	154-0004	QJ-455A *			UF155A	Tone-Panel
B	1Meg	½					UR16-T35	Volume -tapped @ 500KΩ - rear
R2	2000Ω with 100Ω stop	1	159-0004					Sensitivity - Wire Wound

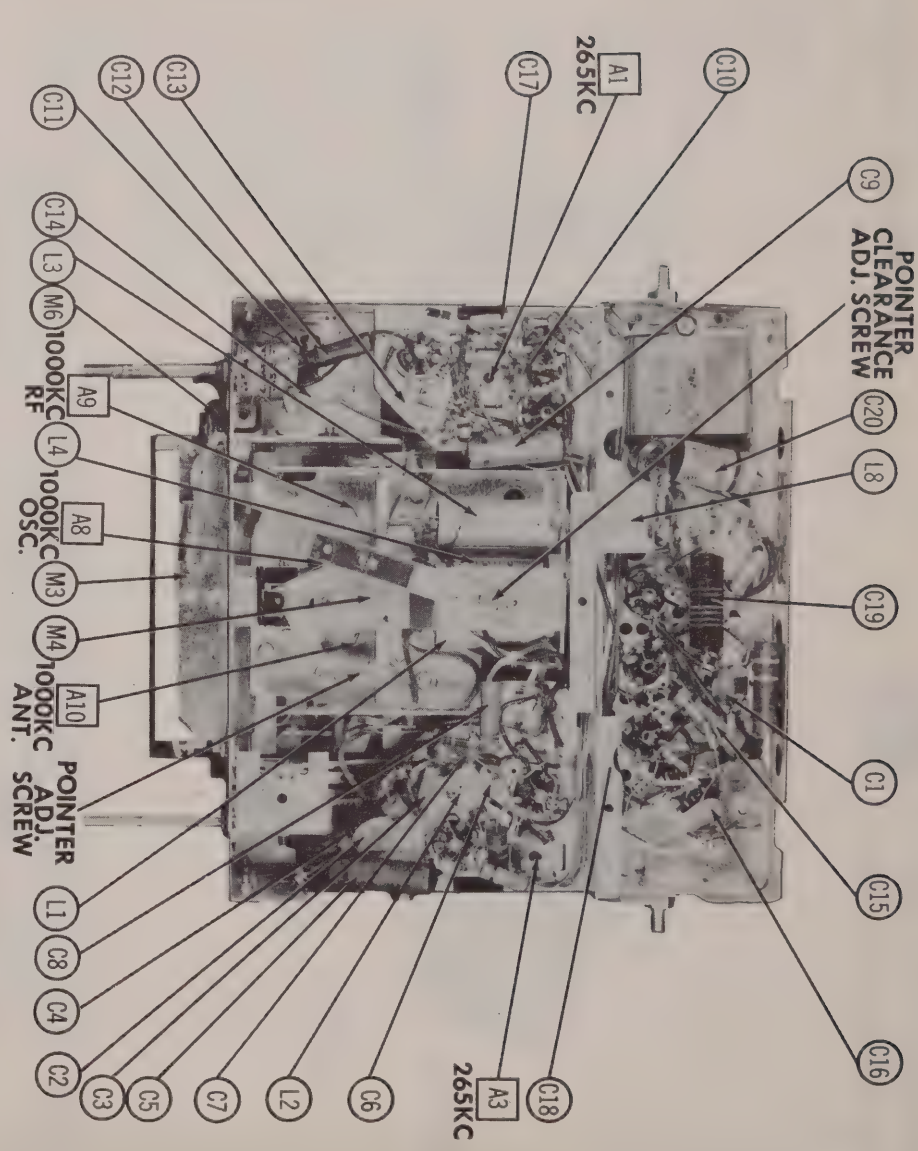
* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-138 & P1-128 (Panel) B19-137X & R1-210 (Rear).

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R3	1Meg	½	181-0105	BTS-1Meg	
R4	10KΩ	1	182-0103	BTA-10K	
R5	330KΩ	½	181-0334	BTS-330K	
R6	47KΩ	½	181-0473	BTS-47K	
R7	15Meg	½	181-0156	BTS-15Meg	
R8	39KΩ	½	181-0393	BTS-39K	
R9	12KΩ	2	183-0123	BTB-12K	
R10	47KΩ	½	181-0473	BTS-47K	
R11	470KΩ	½	181-0474	BTS-470K	
R12	220KΩ	½	181-0224	BTS-220K	
R13	33KΩ	½	181-0333	BTS-33K	
R14	47Ω	½	181-0470	BTS-47	
R15	1500Ω	½	181-0152	BTS-1500	
R16	15Meg	½	181-0156	BTS-15Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R17	330KΩ	½	181-0334	BTS-330K	
R18	1Meg	½	181-0105	BTS-1Meg	
R19	1Meg	½	181-0105	BTS-1Meg	
R20	2700Ω	½	181-0272	BTS-2700	
R21	6.8Meg	½	181-0685	BTS-6.8Meg	
R22	150KΩ	½	181-0154	BTS-150K	
R23	330KΩ	½	181-0334	BTS-330K	
R24	47KΩ	½	181-0473	BTS-47K	
R25	150KΩ	½	181-0154	BTS-150K	
R26	390Ω	1	182-0391	BTA-390	
R27	220KΩ	½	181-0224	BTS-220K	
R28	1800Ω	2	189-0002	BTB-1800	
R29	150Ω	1	182-0151	BTA-150	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3V @ 3.5A	470VCT .053ADC			141-0025		P-3068 ①		

① Fabricate new mounting.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	8.4KΩ	3.5Ω	420Ω	.37Ω	143-0024	A-3856 ①	A-2900 ①	RO-301 ①	S-51X ①	① Drill new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6 x 9"	PM	3.5Ω	539-0001	ST-810 Mod. P69-V	69A2	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	10.5Ω		111-0019				
L2	IF Trap			118-0008				Wound on Capacitor
L3	RF Coil	10.5Ω		112-0011				
L4	Osc. Coil	1Ω	4.4Ω	113-0024				
L5	Input IF	37Ω	35Ω	121-0020	16-6752	BC-350	12-H1	
L6	Output IF	40Ω	40Ω	122-0022	16-6754	BC-354	12-H6	
L7	Fil. Choke	.1Ω		145-0007				
L8	Vibrator Hash Choke	.04Ω		147-0007			5221	11 Microhenries

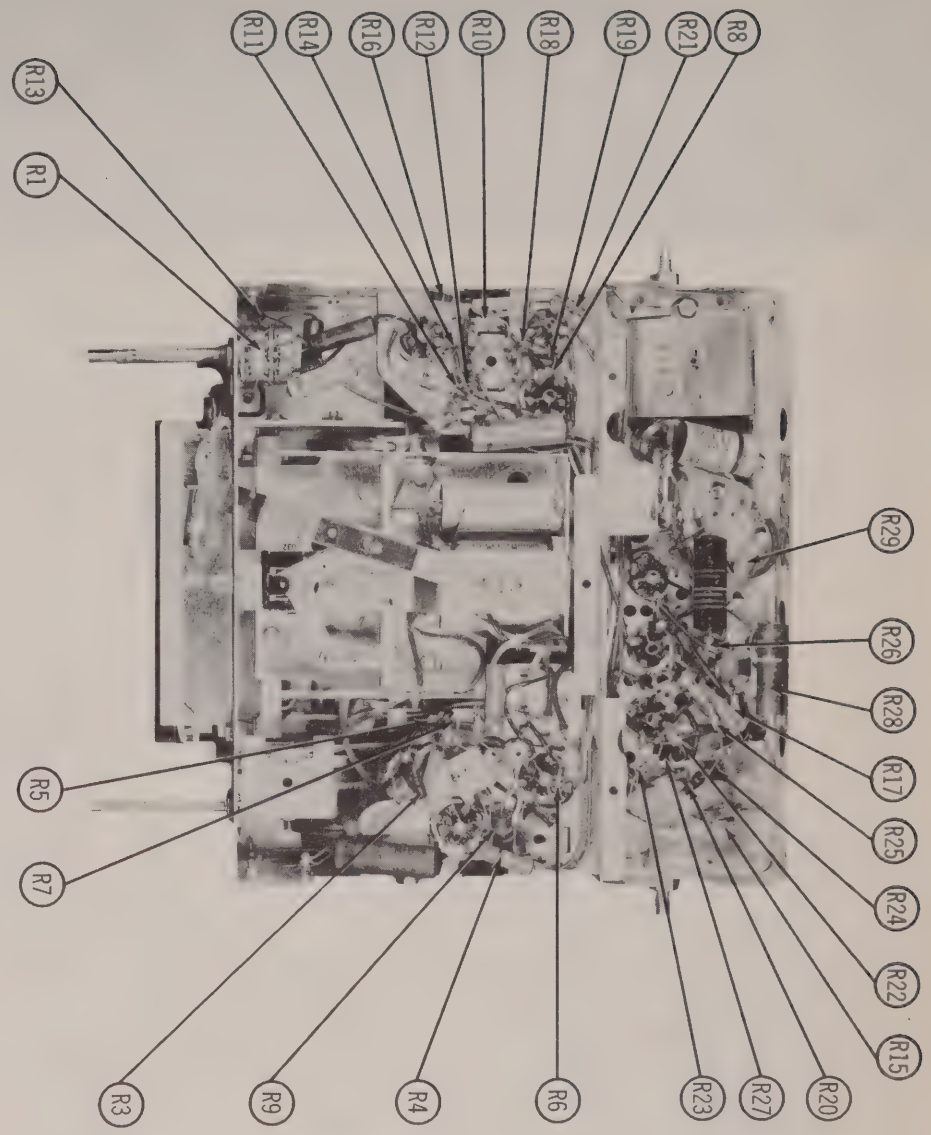
VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				SYLVANIA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Int.	6.3V	115∿	511-0001	5301	859	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SYLVANIA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	191-0002	5620006	307014 (SFE14A)	157014	SFE14	HDI

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	Dial Light	611-0044	Type #44
M4	Tuner Assy.	313-0025	Mechanical portion only, including push buttons, driven clutch disc, crown gear, and tuning control shaft.
M5	Switch	571-004	Off/On
M6	Switch	577-0003	Dimmer
A7	Trimmer Capacitor	172-0033	Antenna
	Capacitor	173-0002	Dual, Trimmer & Fixer
	Dial	727-0005	Background Assy.
	Pointer Support	492-0049	Bracket Assy.
	Dial	722-0029	
	Escutcheon	713-0003	Includes Dial Assy.
	Pointer	791-0023	
	Knob	744-0020	Tone
	Knob	740-0026	Volume
	Knob Assy.	720-0027	Tuning & Trim.

PUSH BUTTON ADJUSTMENTS

Collapse antenna to reduce signal strength.

Operate receiver for 15 minutes before adjusting push-buttons.

Turn push-button one turn counter-clockwise with the fingers to loosen.

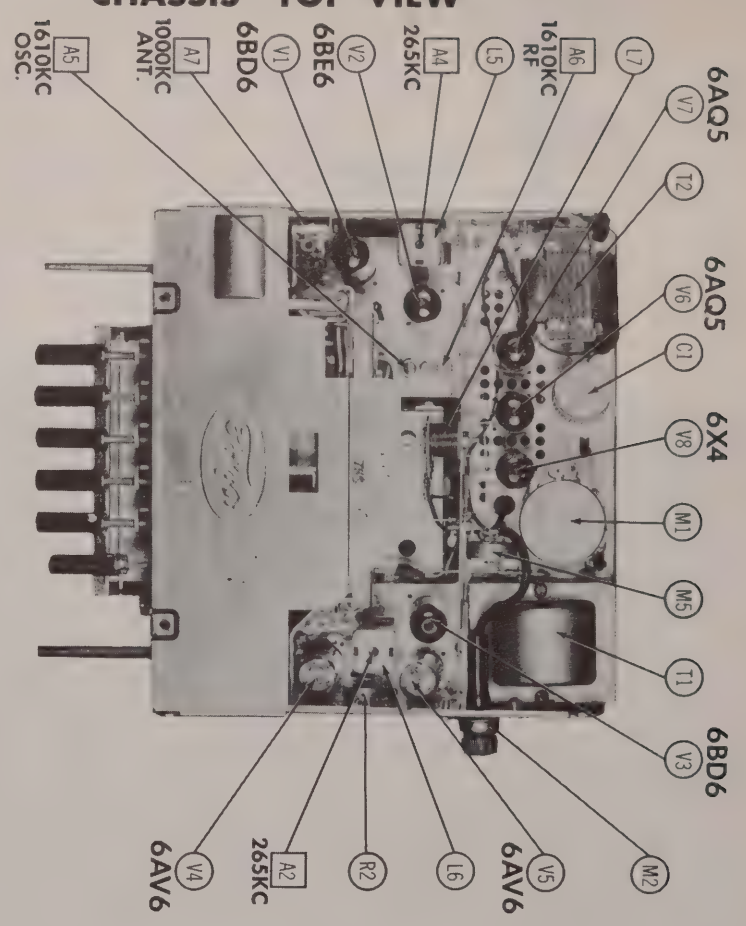
Turn manually to desired station signal.

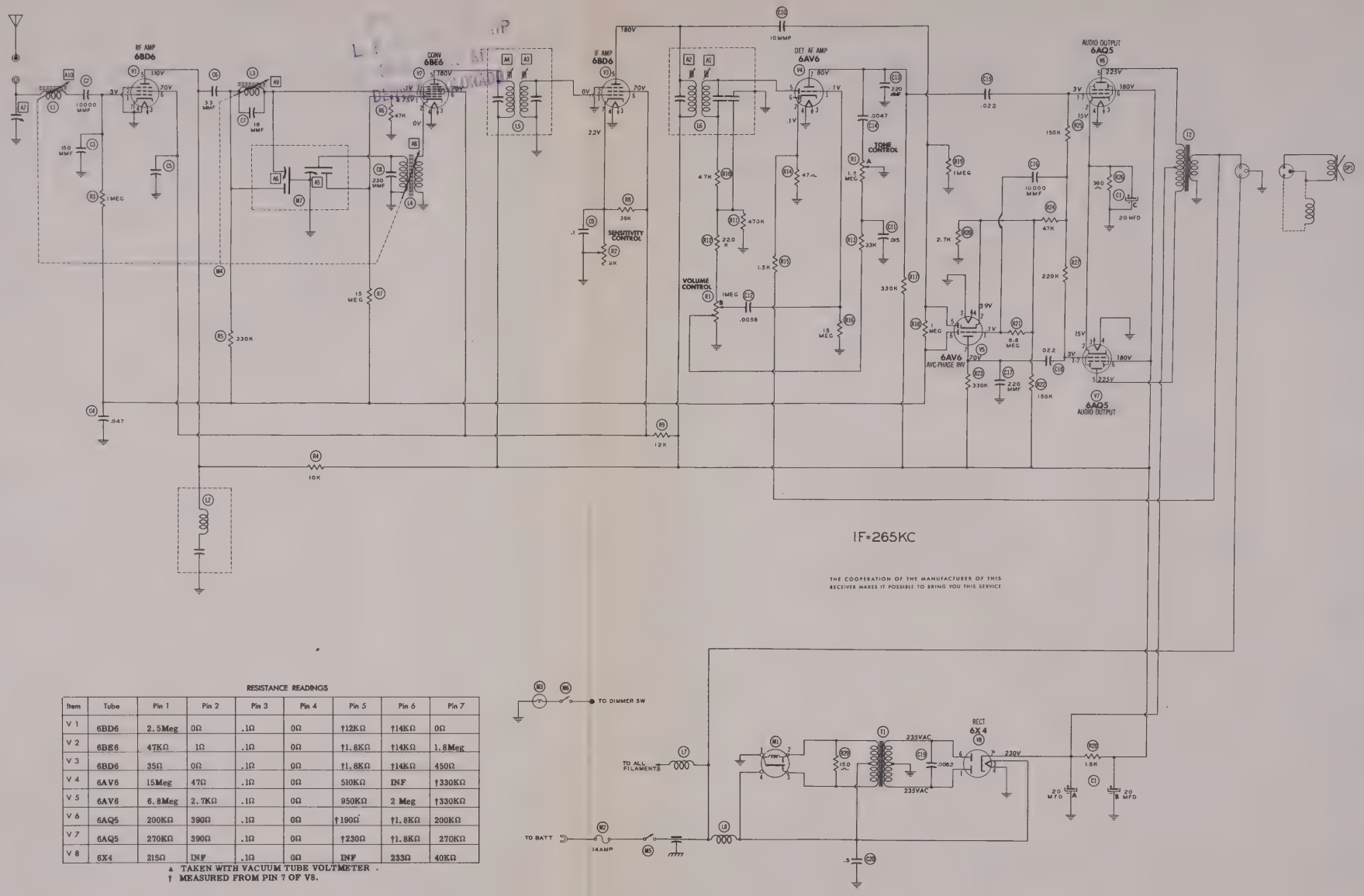
Press button in firmly and release.

Tighten push-button with the fingers.

Repeat the procedure with remaining push-buttons.

CHASSIS—TOP VIEW





RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	2.5Meg	0Ω	.1Ω	0Ω	†12KΩ	†14KΩ	0Ω
V 2	6BE6	47KΩ	1Ω	.1Ω	0Ω	†1.8KΩ	†14KΩ	1.8Meg
V 3	6BD6	35Ω	0Ω	.1Ω	0Ω	†1.8KΩ	†14KΩ	450Ω
V 4	6AV6	15Meg	47Ω	.1Ω	0Ω	510KΩ	INF	†330KΩ
V 5	6AV6	6.8Meg	2.7KΩ	.1Ω	0Ω	950KΩ	2 Meg	†330KΩ
V 6	6AQ5	200KΩ	390Ω	.1Ω	0Ω	†190Ω	†1.8KΩ	200KΩ
V 7	6AQ5	270KΩ	390Ω	.1Ω	0Ω	†230Ω	†1.8KΩ	270KΩ
V 8	6X4	215Ω	INF	.1Ω	0Ω	INF	233Ω	40KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER.
† MEASURED FROM PIN 7 OF V8.

1-DC Voltage measurements are at 20,000 ohms per volt:AC Voltages measured at 1000 ohms per volt.
2-Socket connections are shown as bottom views.
3-Measured values are from socket pin to common negative.
4-Battery voltage maintained at 6.3Volts for voltage readings.
5-Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6-Volume control at maximum, no signal applied for voltage measurements.

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MODEL 2763A

MUNTZ MODELS 2763A, 2764A, 2765A, (Ch. 17B8 Serial No. above 374500)

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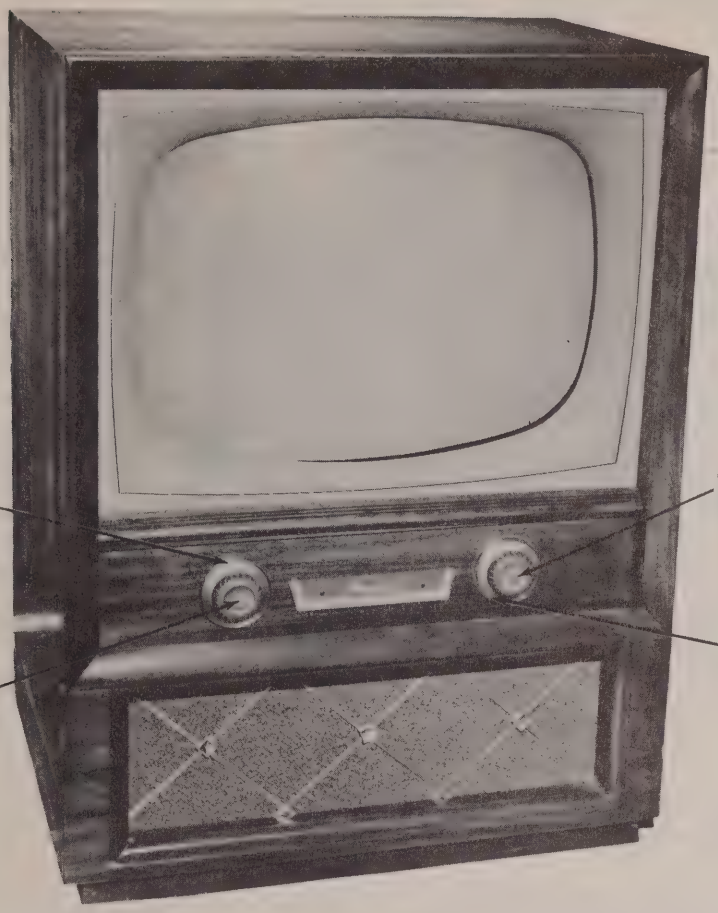

DENVER, COLORADO

MUNTZ MODELS 2763A, 2764A, 2765A, (Ch. 17B8 Serial No. above 374500)

MUNTZ MODEL 2763A

TRADE NAME	Muntz Models 2763A, 2764A, 2765A (Ch. 17B8 Serial No. above 374500)
MANUFACTURER	Muntz TV Inc., 1735 W. Belmont, Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.96 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 25.1MC, Sound IF 20.6MC (Intercarrier)

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Tube Placement Chart (Top View) 5

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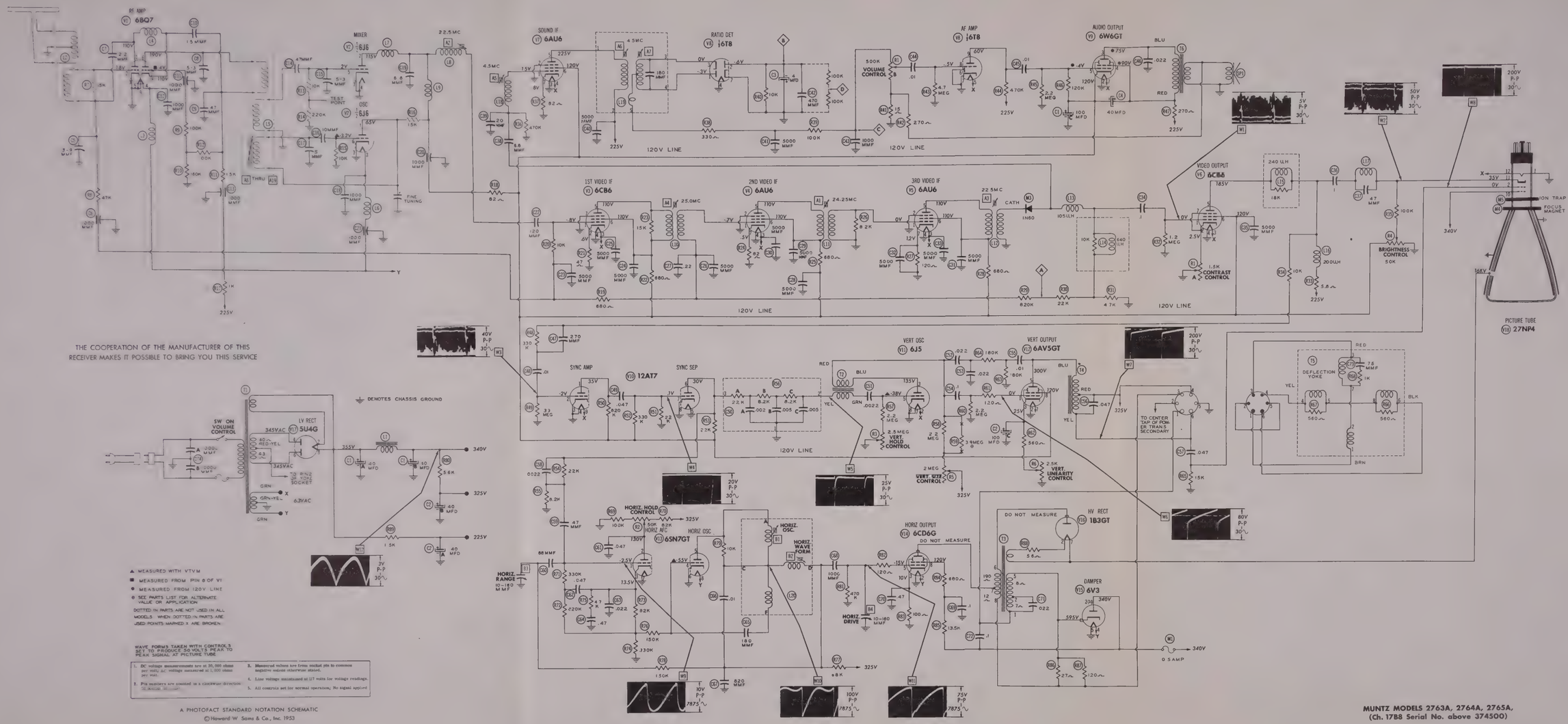
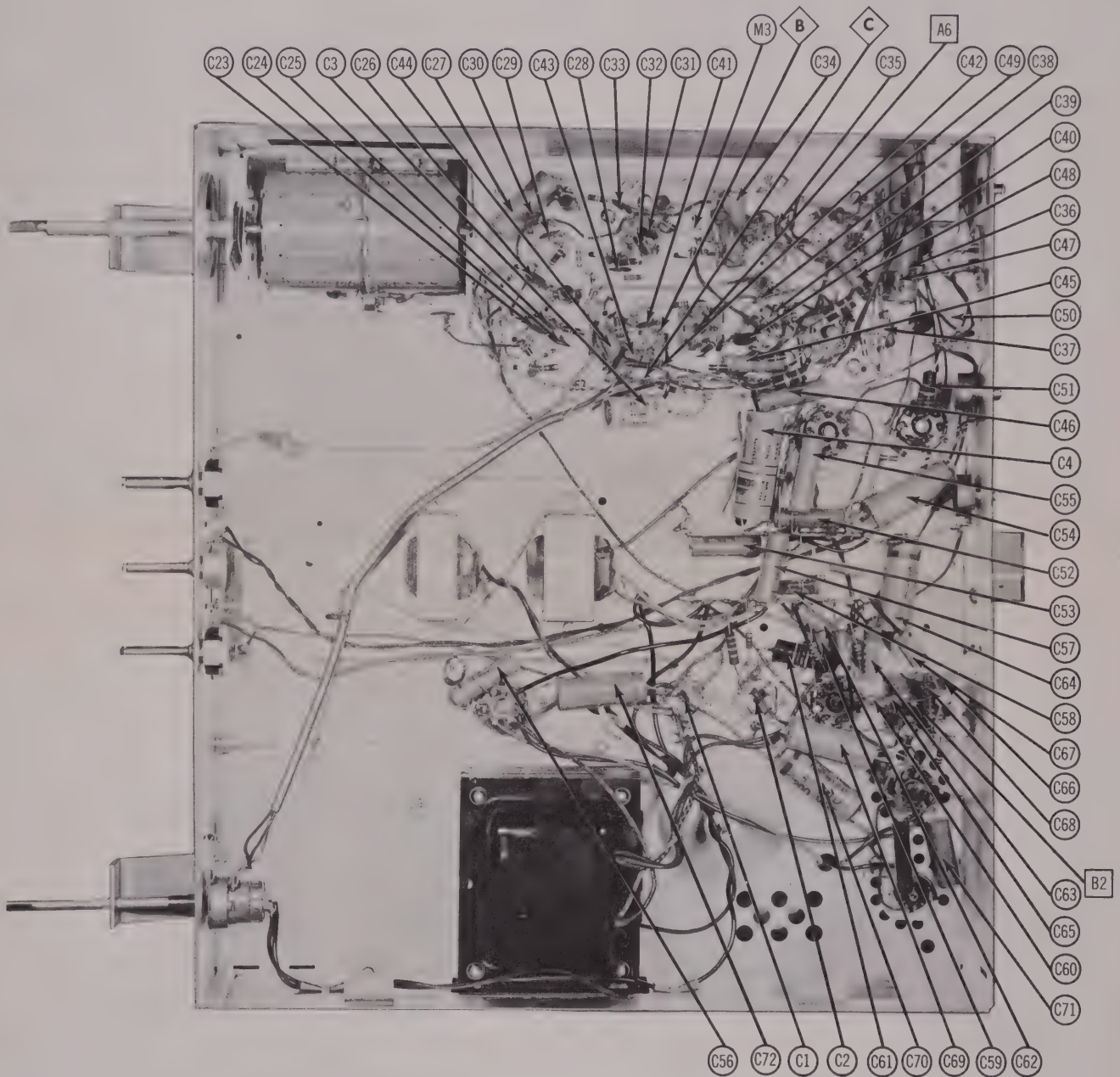
DATE 7-53 SET 208 FOLDER 7


RF AMP V1 6BQ7
MIXER V2 6J6
OSC V3 6J6
22.5MC
SOUND IF V7 6AU6
4.5MC
RATIO DET V8 6T8
AF AMP V9 6T8
AUDIO OUTPUT V3 6W6GT
VOLUME CONTROL
1ST VIDEO IF V3 6CB6
25.0MC
2ND VIDEO IF V4 6AU6
24.25MC
3RD VIDEO IF V5 6AU6
22.5MC
CATH
1N60
VIDEO OUTPUT V6 6CB6
CONTRAST CONTROL
BRIGHTNESS CONTROL
ION TRAP
FOCUS MAGNET
PICTURE TUBE V16 27NP4
SYNC AMP V10 12AT7
SYNC SEP
VERT OSC V11 6J5
VERT OUTPUT V17 6AV5GT
VERT. HOLD CONTROL
VERT. SIZE CONTROL
VERT. LINEARITY CONTROL
DEFLECTION YOKE
TO CENTER TAP OF POWER TRANS. SECONDARY
SW ON VOLUME CONTROL
LV RECT V17 5U4G
DENOTES CHASSIS GROUND
HORIZ. HOLD CONTROL
HORIZ. AFC
HORIZ OSC V13 6SN7GT
HORIZ. OSC.
HORIZ. WAVE FORM
HORIZ. RANGE
HORIZ. DRIVE
HORIZ OUTPUT V14 6CD6G
DO NOT MEASURE
HV RECT V15 1B3GT
DAMPER V15 6V3
120V LINE
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
▲ MEASURED WITH VTVM
■ MEASURED FROM PIN 8 OF V1
● MEASURED FROM 120V LINE
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction as shown.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953
MUNTZ MODELS 2763A, 2764A, 2765A, (Ch. 17B8 Serial No. above 374500)

MUNTZ MODELS 2763A, 2764A, 2765A (Ch. 17B8 Serial No. above 374500)

CHASSIS TOP VIEW

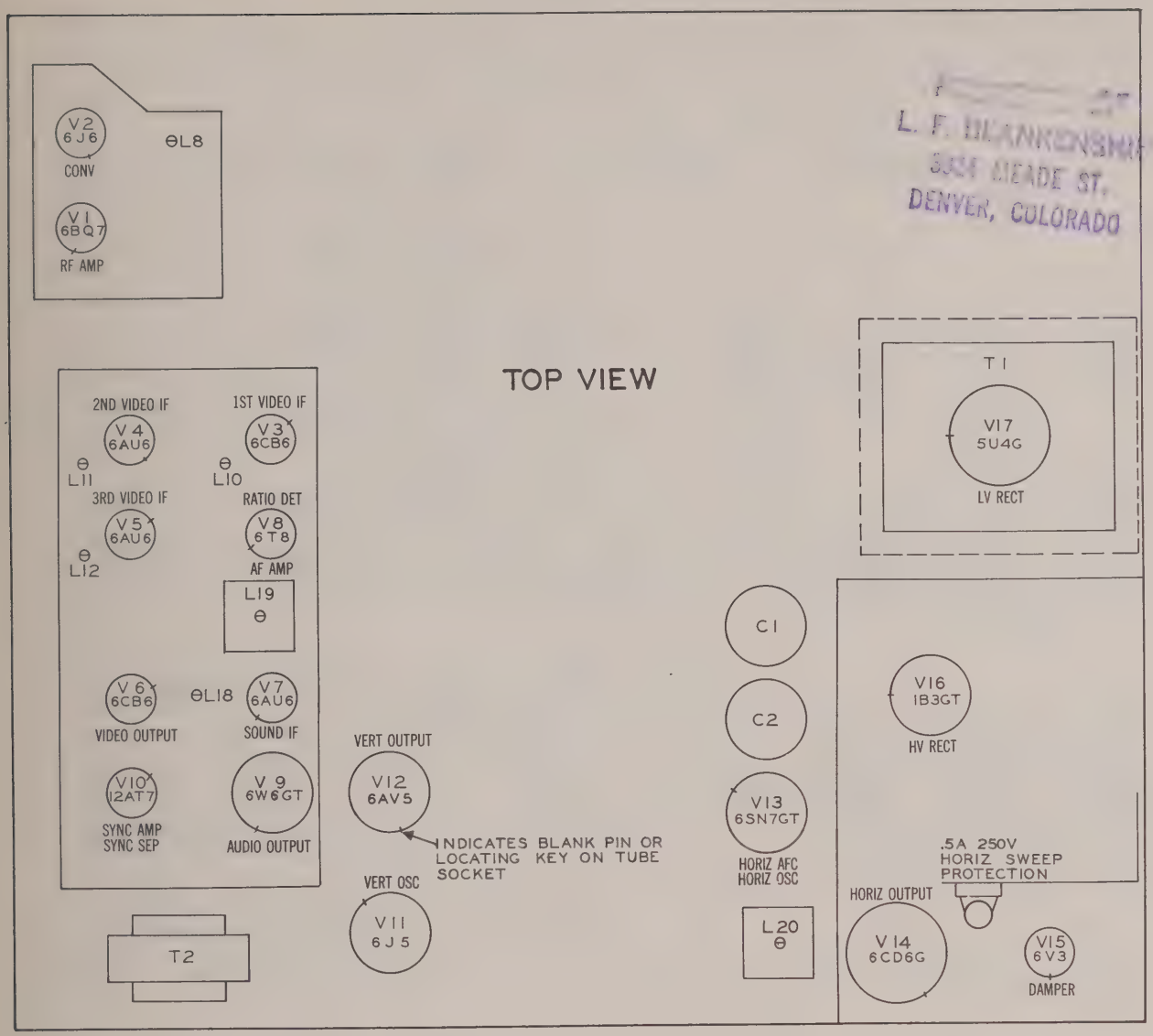


DENVER, COLORADO

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

MUNTZ MODELS 763A, 764A, 765A
(Ch. 178 Serial No. above 374500)

TUBE PLACEMENT CHART



L. F. BLANKENSHIP
3334 MEADE ST.
DENVER, COLORADO

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V17

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V18
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V10, V11
No horiz. sync - V10, V13
No vert. or horiz. sync - V10

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V18, Fuse (M1)
No vertical deflection - V11, V12
Poor vert. linearity or foldover - V11, V12
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V16, V17
Vert. off freq. - V10, V11
Horiz. off freq. - V10, V13

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Turn the slugs all the way down before aligning. Use only enough signal to obtain a usuable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24.25MC (Unmod.)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	22.5MC	"	"	A2, A3	"
3.	"	"	25.0MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	20.6MC 22.6MC 24.3MC 25.1MC	Any	Vert. Amp. to point (A). Low side to chassis.		Check for response as in Fig. 1. If necessary retouch A1 thru A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.
Turn contrast control fully counter clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.01MFD	High side to junction of video detector crystal and C38. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B) Common to chassis.	A5, A6	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to point (C) Common to point (D)	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Turn contrast control fully counter clockwise.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to junction of video detector crystal and C38. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C3. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
6.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A7	Reconnect capacitor C3. Adjust so that 4.5 MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

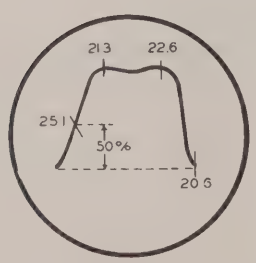


FIG. 1

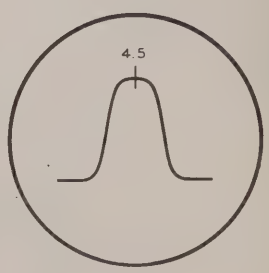


FIG. 2

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft.
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A8	Adjust to place video marker at 50% on high frequency slope of IF response curve as in Fig. 4.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A9	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A10	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A11	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A12	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A13	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A14	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A15	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A16	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A17	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A18	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A19	

THE RF AND MIXER PORTION OF THIS TUNER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

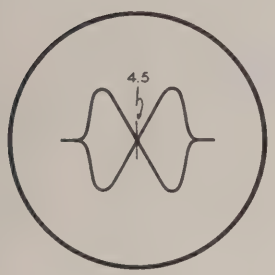


FIG. 3

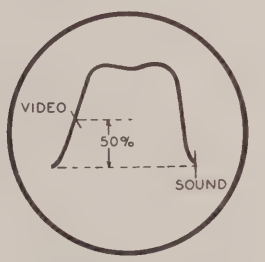
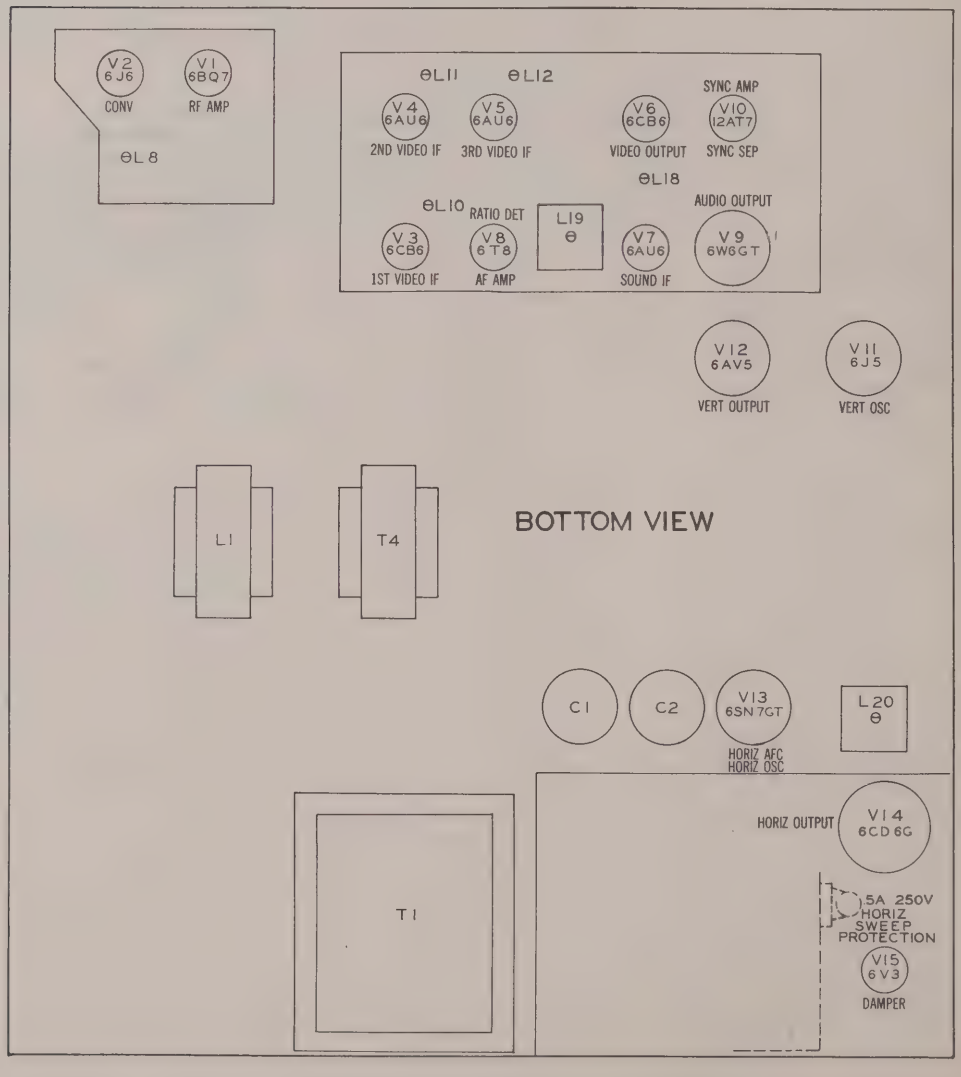


FIG. 4

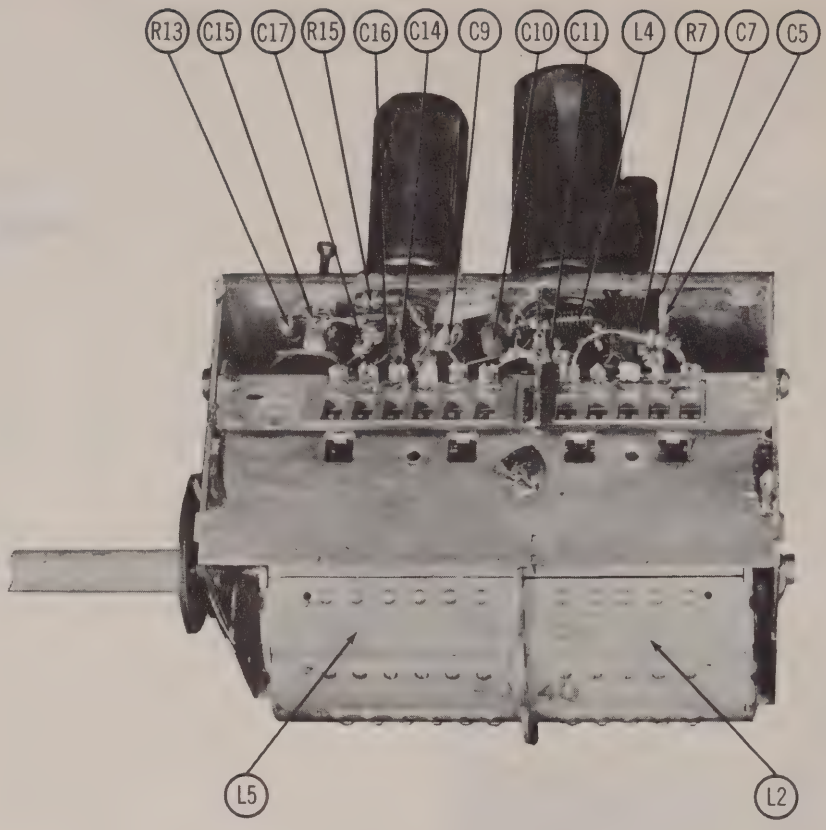
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	900KΩ	0Ω	.1Ω	0Ω	†4KΩ	†170KΩ	INF	0Ω
V 2	6J6	‡15KΩ	‡82Ω	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	855KΩ	47Ω	.1Ω	0Ω	‡680Ω	‡680Ω	0Ω		
V 4	6AU6	845KΩ	0Ω	.1Ω	0Ω	‡680Ω	‡680Ω	82Ω		
V 5	6AU6	.2Ω	0Ω	.1Ω	0Ω	‡680Ω	‡680Ω	120Ω		
V 6	6CB6	1.2Meg	14Ω	.1Ω	0Ω	†7.1KΩ	‡0Ω	14Ω		
V 7	6AU6	470KΩ	0Ω	0Ω	.1Ω	†1.5KΩ	‡0Ω	82Ω		
V 8	6T8	560KΩ	10KΩ	560KΩ	0Ω	.1Ω	0Ω	0Ω	4.7Meg	†470KΩ
V 9	6W6GT	INF	0Ω	†2KΩ	†1.7KΩ	2.2Meg	†1.5KΩ	.1Ω	40KΩ	
V 10	12AT7	‡820KΩ	3.9Meg	0Ω	0Ω	0Ω	‡18KΩ	22KΩ	0Ω	.1Ω
V 11	6J5	INF	.1Ω	†1.7Meg	INF	2.9Meg	2.2Meg	0Ω	0Ω	
V 12	6AV5GT	2.2Meg	0Ω	980Ω	INF	†6Ω	INF	.1Ω	‡0Ω	
V 13	6SN7GT	1.4Meg	70KΩ	410KΩ	480KΩ	†73KΩ	0Ω	0Ω	.1Ω	
V 14	6CD6G	INF	.1Ω	100Ω	†13KΩ	470KΩ	5.6KΩ	0Ω	†14KΩ	Top Cap ▲32Ω
V 15	6V3	INF	†0Ω	INF	.1Ω	0Ω	INF	†0Ω	INF	Pin 9 †0Ω / Top Cap INF
V 16	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ▲222Ω
V 17	5U4G	INF	100KΩ	INF	40Ω	INF	42.7Ω	INF	100KΩ	
V 18	27NP4	0Ω	15KΩ	Pin 10 †0Ω	Pin 11 120KΩ	Pin 12 .1Ω				

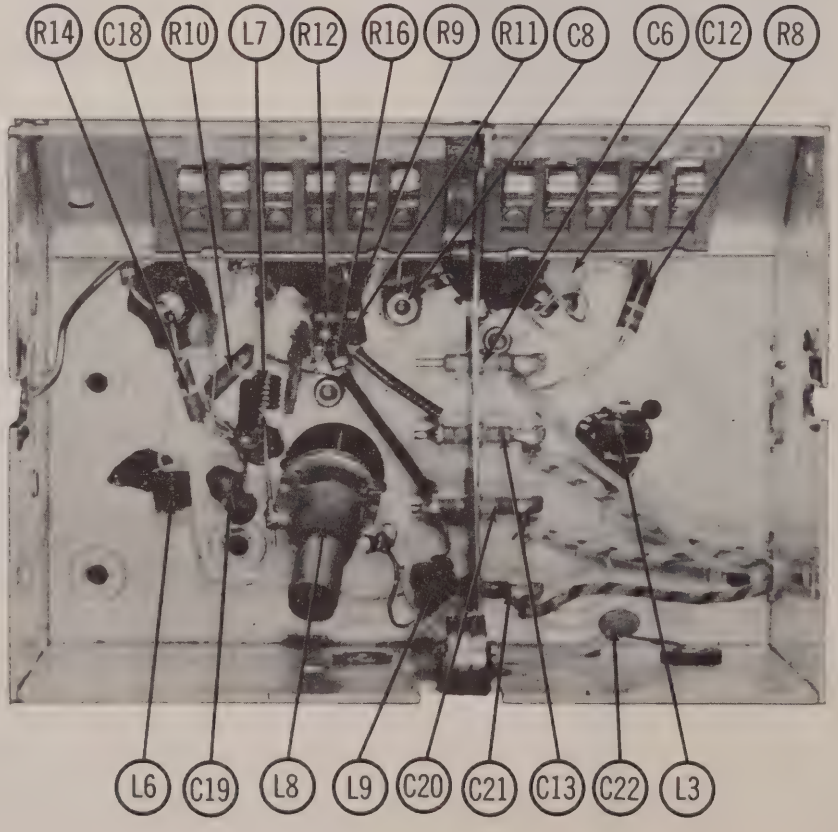
† MEASURED FROM PIN 8 OF V17.
‡ MEASURED FROM PIN 8 OF V9.
▲ MEASURED FROM TOP CAP OF V15.



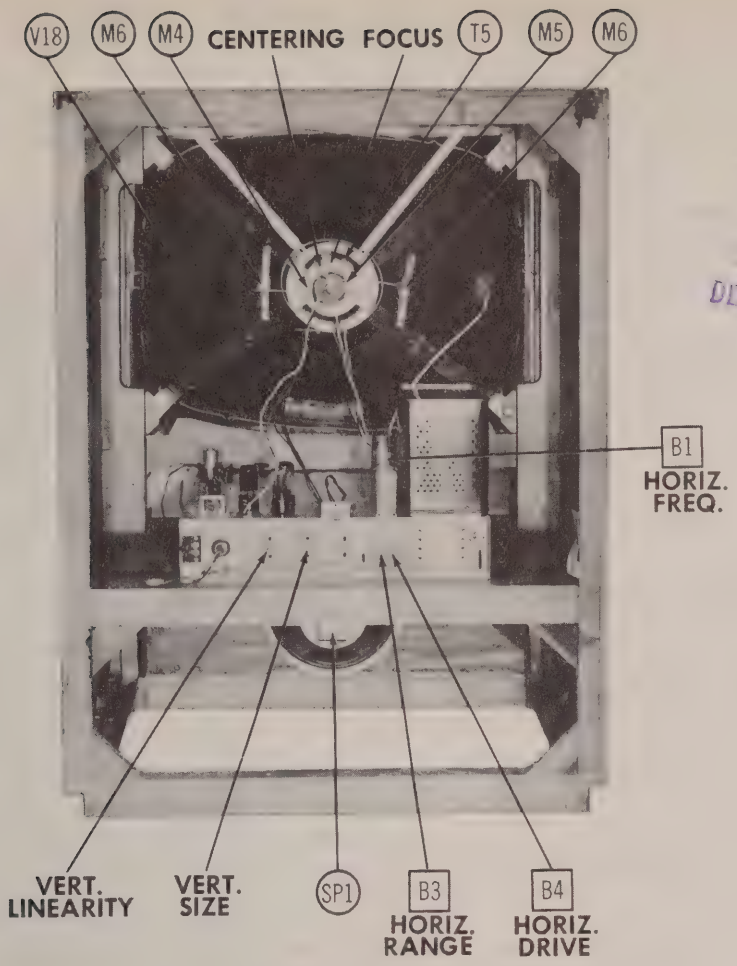
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



DENVER, COLORADO

CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Preset the horizontal oscillator slug (B1) and the horizontal waveform slug (B2) in maximum counter clockwise direction.

Short terminals C and D of L20 horizontal oscillator coil with a jumper wire.

Preset the horizontal range trimmer (B3) 1/4 turn from fully clockwise.

Turn the horizontal hold control fully clockwise.

Adjust B1 until picture synchronizes, retouching B3 slightly, if necessary..

Remove the short from terminals C and D of L20. The picture should remain in sync.

If it does not, readjust B3 or B1 to sync the picture. Connect an oscilloscope through a 10MMF capacitor to terminal C on L20. Connect the low side to chassis.

Adjust B2 for a waveform as in Fig. 5 with the broad and narrow peaks of equal height. Remove the scope.

Set the horizontal hold control to fully clockwise position. Adjust B1 for 1 vertical blanking bar.

Rotate the horizontal hold control fully counter clockwise.

The picture should remain in sync.

Adjust the horizontal drive trimmer (B4) counter clockwise as far as possible without the presence of vertical white lines or compression of the center of the picture.

(Note: If B4 is adjusted the ion trap setting should be checked).

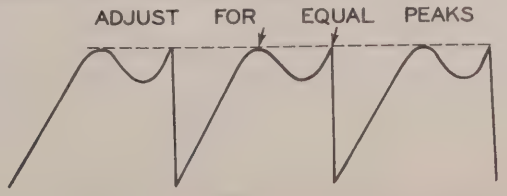


FIG. 5

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Substitute V13, V14 and V15. Check T3 and Horiz. deflection yoke.

INSUFFICIENT SWEEP

Substitute V13, V14, and V15. Check waveform at W11.

If Satisfactory	If Unsatisfactory
Check C69, C71 and C72. Check T3 and other components associated with V14 and V15.	Check C66, C67 and C68. Check other components associated with V13 and V14.

DRIVE LINES

Substitute V14 and V15. Check adjustment of B4. Check C69, C71 and C72. Check T3.

COMPRESSED LEFT SIDE

Substitute V13, V14 and V15. Check setting of B4. Check T3.

FOLDS

Substitute V14 and V15. Check C68, C69, C71, C72, T3 and other components associated with the Horiz. Output Stage.

XMAS TREE EFFECT

Substitute V13. Check C65, C66, C67, C68 and L20.

VERTICAL

LOSS OF SWEEP

Substitute V11 and V12. Check T2, T4, C51, C54, C52, C53, C55 and yoke. Check other components associated with Vert. Oscillator and Output stages.

INSUFFICIENT SWEEP

Substitute V11 and V12. Check C2B, C2C and R80. Check T2, T4, C51, C54, yoke and other associated components.

COMPRESSED AT BOTTOM

Substitute V11 and V12. Check C2C, T4, yoke and other associated components.

COMPRESSED AT TOP

Substitute V11 and V12. Check C2C, C2B, C52, C51 and associated components.

FOLDS

Substitute V11 and V12. Check C2B, T2, T4, yoke and associated components.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V13. Check C58, C59, C62 and other components associated with V13A.

CRITICAL SYNC

Substitute V13. Check C58, C59, C62, C61, C63, C64, L20 and other components associated with V13.

PULLING PICTURE

Substitute V13. Check C61, C63 and C64. Check L20 and other associated components.

VERTICAL

LOSS OF SYNC

Substitute V11. Check vertical integrator network. Check C51 and T2.

CRITICAL SYNC

Substitute V10 and V11. Check video signal at W3 and W4 for signal overload and sync clipping. Check vertical integrator network.

TRIGGERING

Substitute V10 and V11. Check circuits of V10 and V11 for filament lead dress.

VIDEO

SOUND BARS

Check adjustment of local oscillator and A5. Check fixed 4.5MC trap (L17 and C37).

POOR RESOLUTION

Substitute V1, V3, V4 and V5. Check video detector crystal. Check video IF alignment. Check components of Video IF Strip.

POOR CONTRAST

Substitute V6. Check C36. Check video detector crystal. Check picture tube.

SMEAR

Substitute V6. Check L15 for open and R33 for change of value. Check C34 and C35. Check picture tube.

ONE WIDE BLACK BAR ACROSS PICTURE

Check RF Tuner, Video IF and Video Amplifier stages for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Substitute V7, V8 and V9. Check Sound IF and Ratio detector alingment. Check circuit components.

BUZZ

Check adjustment of ratio detector secondary (A7). If buzz is still objectionable, substitute V8 and readjust A7.

DISTORTED

Check sound IF and ratio detector alignment. Check audio amplifier and output stages using audio signal generator.

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Output	6CB6	6CB6	7CM	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector-AF Amplifier	6T8	6T8	9E	
V9	Audio Output	6W6GT	6W6GT	7S	
V10	Sync. Amplifier-Sync. Seperator	12AT7	12AT7	9A	
V11	Vert. Oscillator	6J5	6J5	6Q	
V12	Vert. Output	6AV5GT	6AV5GT	6CK	
V13	Horiz. AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V14	Horiz. Output	6CD6G	6CD6G	5BT	
V15	Damper	6V3	6V3	9BD	
V16	HV Rectifier	1B3GT	1B3GT	3C	
V17	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V18	27NP4	27GP4 ①		12D	① Circuit changes necessary

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MUNTZ PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450		AFH3-159		C118		FP375	TVL-3764	
B	■40	450								
C	▲100	200								
C2A	▲40	450		AFH3-142		C109		FP375	TVL-3764	
B	■40	450								
C	▲100	50								
C3	4	50		PR8150/4		BR415		TC30	TVA-1402	
C4	40	250		PR8250/40		BR4025A		TC58	TVA-1511	
C5	3-9				829-10					
C6	1000			CN-1-001	MFT-1000				503C-D1	
C7	2.2			SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C8	1.5-3				829-3			CT565A		
C9	47			BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C10	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C11	1000			CN-1-001	MFT-1000				503C-D1	
C12	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C13	1000			CN-1-001	MFT-1000				503C-D1	
C14	47			BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C15	1.5-3				829-3			CT565A		
C16	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C17	5			SI5N750	TCN-5		N750K-050	NT-555	5TCUB-V5	
C18	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C19	5.8			SI5.8NP0	TCZ-5.8		NP0K-5R8	ZT-5568	5TCCB-V58	
C20	1000			CN-1-001	MFT-1000				503C-D1	
C21	1000			CN-1-001	MFT-1000				503C-D1	
C22	120			BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C23	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C24	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C25	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C26	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C27	.22	200		P468-22		PTE4P22		PT4025	2TM-P22	
C28	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C29	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C30	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C31	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C32	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C33	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	.1	400		P488-1	DF-104	PTK4P1		PT401	4TM-P1	
C35	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C36	.1	600		P688-1	DF-104	PTK5P1		PT601	6TM-P1	
C37	47			SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C38	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C39	20			SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C40	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C41	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C42	470			SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C43	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C44	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C45	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C46	.022	600		P688-022	DD-203	PTE6S22		PT6122	6TM-S22	
C47	270			SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C48	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C49	.047	400		P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C50A	.002			P688-002		PTE6D2		PT622		
B	.005		◆CR1	P688-005	◆PC-100	PTE6D5	◆1405-01	PT625	◆101C1	
C	.005			P688-005		PTE6D5		PT625		
C51	.0022	600		P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C52	.022	600		P688-022	DD-203	PTE6S23		PT6122	6TM-S22	
C53	.022	600		P688-022	DD-203	PTE6S22		PT6122	6TM-S22	
C54	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C55	.01	1000		P1088-01	DD16-103	PTE16S1		PT1611	MB-S1	
C56	.047	600		P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C57	.047	600		P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C58	.0022	600		P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C59	47	500		1469-00005	TCZ-47	SR5Q5	NP0L-470	MCB225	MS-45	
C60	68	1000		HVD15-000068	D16-680			MC1468	10GA-Q68	
C61	.047	600		P688-047	DF-503	PTE6S47		PT6147	6TM-S47	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MUNTZ PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C62	.047	600		P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C63	.022	200		P488-022	DD-203	PTE4S22		PT4122	4TM-S22	
C64	.47	200		P288-47		PJ2P5		PT405	2TM-P47	
C65	180									
C66	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C67	820	500								
C68	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C69	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C70	.47	200		P288-47		PJ2P5		PT405	2TM-P47	
C71	.022	600		P688-022	DD-203	PTE6S22		PT6122	6TM-S22	
C72	.1	600		P688-1		PTE6P1		PT601	6TM-P1	
C73	75	2000								
C74A	10000			BPD-2X01	DD-3-103	TM5DS1	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		

◆ Items C50A, C50B, C50C, R56A, R56B, R56C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MUNTZ PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	VC-0040-1	QJ-454*	RTV-408			Contrast-Panel
B	500KΩ	½						Volume-Rear
R2A	50KΩ	½	VC-0036	Q11-123	AG-44-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A
R3A	2.5Meg	½	VC-0046	Q11-239	AG-64-S	AB-83	U-255	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R3A
R4A	50KΩ	½	VC-0036	Q11-123	AG-44-S	AB-31	U-35	Brightness
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R4A
R5A	2 Meg	½	VC-0034F	Q11-139	AG-83-S	AB-75	SU-56	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	2500Ω	½	VC-0037D	Q11-112	AG-15-S	AB-7	U-8	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A

CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B17-109 & P1-314 (Panel) B13-133 & R2-401 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MUNTZ PART No.	IRC PART No.	NOTES
R7	15KΩ	½		BTS-15K	
R8	47KΩ	½			
R9	100KΩ	½		BTS-100K	
R10	160KΩ-5%	½		BTS-160K-5%	
R11	1500Ω	½		BTS-1500	
R12	100KΩ-5%	½		BTS-100K-5%	
R13	10KΩ	½		BTS-10K	
R14	220KΩ	½		BTS-220K	
R15	10KΩ	½			
R16	15KΩ	½			
R17	1000Ω	½		BTS-1000	
R18	82Ω	½		BTS-82	
R19	680Ω	½		BTS-680	
R20	10KΩ	½		BTS-10K	
R21	47Ω	½		BTS-47	
R22	680Ω	½		BTS-680	
R23	15KΩ	½			
R24	82Ω	½		BTS-82	
R25	680Ω	½		BTS-680	
R26	8200Ω	½			
R27	120Ω	½		BTS-120	
R28	680Ω	½		BTS-680	
R29	820KΩ	½		BTS-820K	
R30	22KΩ	½		BTS-22K	
R31	4700Ω	½		BTS-4700	
R32	1.2Meg	½		BTS-1.2Meg	
R33	5600Ω	2		BTB-5600	
R34	10KΩ	½		BTS-10K	
R35	100KΩ	½		BTS-100K	
R36	470KΩ	½			
R37	82Ω	½		BTS-82	
R38	330Ω	½		BTS-330	
R39	100KΩ	½		BTS-100K	
R40	10KΩ	½		BTS-10K	
R41	15Ω	½		BTS-15	
R42	270Ω	½		BTS-270	
R43	4.7Meg	½		BTS-4.7Meg	
R44	470KΩ	½		BTS-470K	
R45	2.2Meg-5%	½		BTS-2.2Meg-5%	
R46	120KΩ-5%	½		BTS-120K-5%	
R47	270Ω	2			
R48	330KΩ	½		BTS-330K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MUNTZ PART No.	IRC PART No.	NOTES
R49	3.9Meg	½		BTS-3.9Meg	
R50	820KΩ	½		BTS-820K	
R51	22KΩ	½		BTS-22K	
R52	330KΩ	½		BTS-330K	
R53	22KΩ	½		BTS-22K	
R54	22KΩ	½		BTS-22K	
R55	8200Ω	½		BTS-8200	
R56A	22KΩ	½		BTS-22K	
B	8200Ω	½	◆ CR1	BTS-8200	
C	8200Ω	½		BTS-8200	
R57	2.2Meg	½		BTS-2.2Meg	
R58	2.2Meg	½		BTS-2.2Meg	
R59	3.9Meg	½		BTS-3.9Meg	Note
R60	2.2Meg	½		BTS-2.2Meg	
R61	120Ω	½			
R62	560Ω	½		BTS-560	
R63	180KΩ	½		BTS-180K	
R64	180KΩ-5%	½		BTS-180K-5%	
R65	15KΩ	½		BTS-15K	
R66	560Ω	½		BTS-560	
R67	560Ω	½		BTS-560	
R68	1000Ω	½		BTS-1000	
R69	100KΩ	½		BTS-100K	
R70	82KΩ	1		BTA-82K	
R71	330KΩ	½		BTS-330K	
R72	820KΩ	½		BTS-820K	
R73	82KΩ	1		BTA-82K	
R74	330KΩ	1		BTA-330K	
R75	4700Ω	½		BTS-4700	
R76	150KΩ	1		BTA-150K	
R77	68KΩ	1		BTA-68K	
R78	150KΩ	1		BTA-150K	
R79	10KΩ	½		BTS-10K	
R80	5600Ω	½		BTS-5600	
R81	470KΩ	½		BTS-470K	
R82	120Ω	½			
R83	100Ω	2		BW-2-100	
R84	680Ω	½			
R85	13.5KΩ	10		1 3/4A-13.5K	
R86	27Ω	2			
R87	120Ω	½		BTS-120	Note
R88	5.6Ω	9			
R89	1500Ω	9		1 3/4A-1500	

Note. Not used in all models.
◆ Items R56A, R56B, R56C, C50A, C50B, C50C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MUNTZ PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ⑥1.96A	690VCT .225ADC	5 VAC ⑨ 3A	12.6VCT ⑨ 5.8A	TP-0021					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MUNTZ PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	205Ω	1145Ω	TO-0035	A-8125	A-3003	TBO-5	A-97X	208T2 ④	Vert.Osc. Trans.
T3	202ΩTap ⑨ 12Ω	8.7ΩTap ⑨ .7Ω	TO-0036						Horiz.Output Trans.
		SEC. 2 0Ω							
T4	810ΩTap ⑥7.3Ω		TO-0037	A-8115①②	A-3035①②	TSO-1①②	A-107X①②	204T2③①	Vert. Output Trans.
T5A	19Ω		LC-0061						Horiz. Deflection Coils
B	5Ω								Vert. Deflection Coils

① Connect as auto trans.
② Drill new mounting holes.
③ Drill one new mounting hole.
④ Mount on top of chassis.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MUNTZ PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	2.8KΩ	3.9Ω	310Ω	1.08Ω	TO-0033	A-3825①	A-3018	RO-8 ①	S-4X ①	①Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: MUNTZ PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	10"	PM	3.9Ω	SK-0020	10J11	10A31	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: MUNTZ PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.140ADC	92Ω	2.8 Hy.	1C-0059-1	C-2325 ①	C-2974	TR-3300 ①	

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MUNTZ PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L2	Ant. Coils	0Ω CT	0Ω					
L3	Fil. Choke	0Ω						
L4	Neutr. Coil	0Ω						
L5	RF, Mixer Grid & Osc. Coils	0Ω						
L6	Fil. Choke	0Ω						
L7	RF Choke	0Ω						
L8	1st. Video IF	1.2Ω						
L9	RF Choke	1.3Ω						
L10	2nd. Video IF	.2Ω	.2Ω	LI-0042				
L11	3rd. Video IF	.2Ω	.2Ω	LI-0041				
L12	4th. Video IF	.2Ω	.2Ω	LI-0040				
L13	Series Peaking Coil	6.5Ω		LC-0057-2	19-3093	TV-181	4642	105 Microhenries
L14	Shunt Peaking Coil	19Ω		LC-0057-3	19-3660 *		4650 *	640 Microhenries, wound on 10KΩ resistor
L15	Series Peaking Coil	10.2Ω		LC-0057-4	19-3250 †	TV-185 †	4646 †	240 Microhenries, wound on 18KΩ resistor
L16	Shunt Peaking Coil	9Ω		LC-0057-5	19-3180	TV-184	6180	200 Microhenries
L17	4.5MC Trap	2.2Ω		LC-0062 ■	20-1004 ■	TV-151 ■	1470 ■	
L18	Sound IF	4.8Ω		LO-0038-1	17-3400	TV-151	1469	
L19	Ratio Det.	4.2Ω	.4Ω CT	LI-0046	17-1033 ▲	TV-110 ▲	1469 ▲	Tertiary winding - .7Ω
L20	Horiz. Osc.	85Ω		LO-0039	20-1402	TV-162	6183	Tapped ⑨ 60Ω, horiz. waveform winding - 45Ω

* Parallel with 10KΩ resistor
† Parallel with 18KΩ resistor
▲ Drill mounting holes
■ Drill mounting hole

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: MUNTZ PART No. FUSE	MUNTZ PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1/2A 250V ⑥			312.500	357001	AGC-1/2	4405

MISCELLANEOUS

ITEM No.	PART NAME	MUNTZ PART No.	NOTES
M2	RF Tuner		
M3	Crystal Diode		Video Detector (1N60)
M4	Focus Magnet		Includes Centering Device
M5	Ion Trap		
M6	Correction Magnet		
B3	Trimmer Capacitor		Horiz.Range, 10-160MMF
B4	Trimmer Capacitor		Horiz. Drive, 10-160MMF

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TROUBLE SHOOTING AIDS (CONT.)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Substitute V13, V14, V15, V16 and V9. Check waveform at W11.

If Satisfactory	If Unsatisfactory
Check C68, R88, C71, C69, C72, T3 and other components associated with V14, V15 and V16. Check picture tube.	Check B4, C68, C67, C66, L20 and other components associated with V13.

INSUFFICIENT HIGH VOLTAGE

Substitute V13, V14, V15, V16, V9 and V17. Proceed as outlined under Loss of High Voltage.

BLOOMING

Substitute V15 and V16. Check R88 and T3. Check picture tube.

POWER

SMALL AND/OR DIM RASTER

Substitute V17 and V9. Check B plus filter network.

WEAK PICTURE, WEAK SOUND

Substitute V17 and V9. Check B plus filter capacitors and network.

GENERAL

RASTER, NO SOUND, NO PICTURE

Substitute V1, V2, V3, V4, V5 and video detector crystal. Check video IF Components and alignment of video IF stages.

RASTER SNOWY PICTURE WEAK SOUND (Strong signal areas)

Substitute V1, V3, V4 and V5.

RASTER, SOUND, NO PICTURE

Substitute V6. Check components associated with V6. Check picture tube.

INTERMITTANT STREAKS

Check high voltage section for corona discharge and arcing.

TOTAL LOSS OF SYNC

Substitute V10. Check circuit components associated with V10.

POOR FOCUS

Check focalizer unit adjustment. Substitute V17 and check picture tube.

SET DEAD

Check fuse M1. Check AC interlock assembly. Check T1.

Symptoms shown above are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

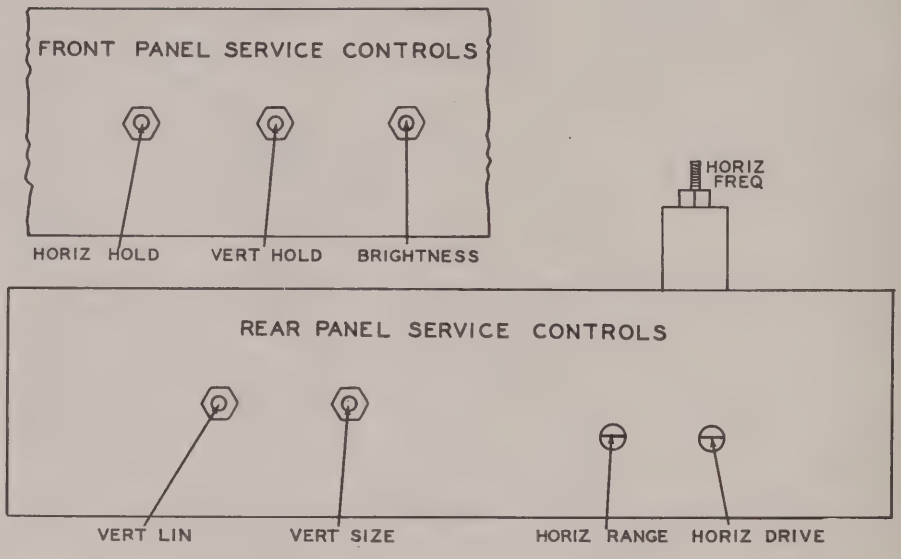
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 4 screws holding wood strip at bottom of safety glass. Remove wood strip and safety glass. Hold safety glass at bottom during removal operation. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instruction).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust adjust the Horiz. Freq. slug L20, until picture synchronizes horizontally. (For location see tube placement chart). If Satisfactory results cannot be obtained by the above adjustment see HORIZ. SWEEP CIRCUIT ADJUSTMENTS on page 11.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz , adjust Ratio Detector Secondary L19 located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for Horizontal Sweep Circuit protection. (For location, see tube placement chart).

ANTI-PIN CUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible, and position the magnets so that all sides are straight lines and the corners are at right angles.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 10 wood and 1 metal screws. Remove rear cover.
3. Remove 1 metal screw. Remove speaker plug.
4. Disconnect yoke plug, HV lead, CRT socket.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.

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RCA VICTOR
MODELS 21-D-305, U, 21-D-317, U, 21-D-326, U, 21-D327, U, 21-D-328, U, 21-D-329, U, 21-D-330, U (Ch. KCS81, B)

RCA VICTOR
MODELS 21-D-305, U, 21-D-317, U, 21-D-326, U, 21-D327, U, 21-D-328, U, 21-D-329, U, 21-D-330, U (Ch. KCS81, B)

PROPERTY OF

RCA VICTOR MODEL 21-D-317U

TRADE NAME	RCA Victor Models 21-D-305, -305U, 21-D-317, -317U, 21-D-326, -326U, 21-D-327, -327U, 21-D-328, -328U, 21-D-329, -329U, 21-D-330, -330U, (Ch. KCS81, KCS81B)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, New Jersey.
TYPE SET	Television Receiver
TUBES	Twenty-Six
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.6 Amp @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83, UHF Video IF 47.75MC, Sound IF 41.25MC (Intercarrier)

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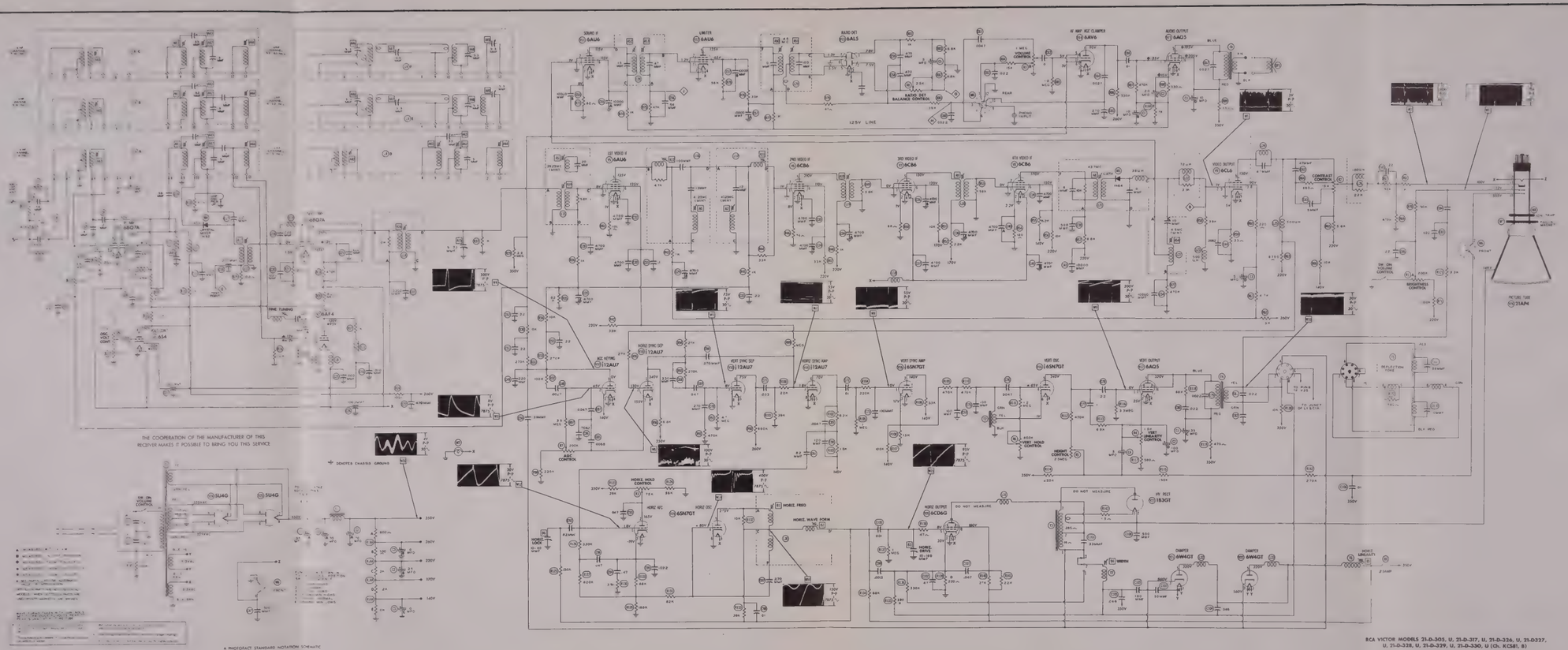

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

DENOTES CHASSIS GROUND

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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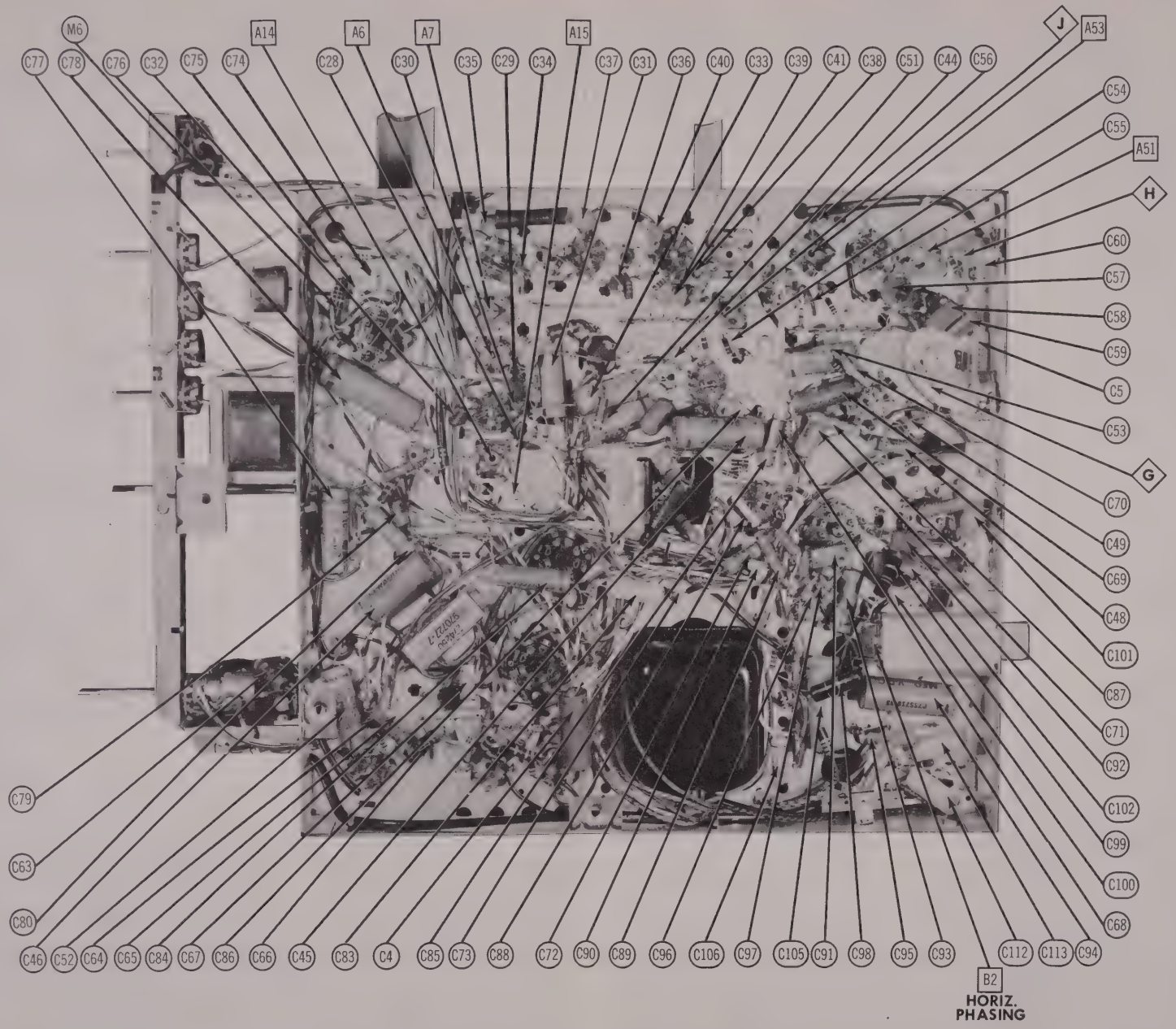
RCA VICTOR MODELS 21-D-305, U, 21-D-317, U, 21-D-326, U, 21-D327, U, 21-D-328, U, 21-D-329, U, 21-D-330, U (Ch. KCS81, B)

RCA VICTOR MODELS 21-D-305, U, 21-D-317, U, 21-D-326, U, 21-D327, U, 21-D-328, U, 21-D-329, U, 21-D-330, U (Ch. KCS81, B)

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF L. F. ELA... 3924 ... DEPT. ...

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal oscillator tube, V19.

ANTENNA MATCHING UNIT ALIGNMENT

The antenna matching unit is properly aligned at the factory. The RF unit is aligned with a particular antenna matching unit in place. If a new antenna matching unit is installed the RF unit should be realigned.
Alignment should not be attempted without the proper alignment facilities.
Disconnect the lead from the FM trap (adjustment A55) to the channel selector switch.
Use a short jumper to connect point (A) on the matching unit through a .001MFD capacitor to pin 1, grid, of 6CB6, V6.
Remove 6AU6, V5, from its socket.
The cover of the matching unit must be in place during alignment.
Connect the ends of a 1000 ohm potentiometer across a 7.5 volt battery capable of withstanding considerable current drain.
Connect the positive terminal to chassis and the potentiometer arm to the ungrounded side of C33. Set arm for -5 volts at C33.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	Not used.	45.75MC (400∿Mod)	Any	Vert. amp to point (B) Low side to chassis.	A1	Set oscilloscope gain to maximum and adjust A1 for MINIMUM 400∿ response.
2.	"	"	"	41.25MC (400∿Mod)	"	"	A2	Adjust for MINIMUM 400∿ response on scope.
3.	"	"	50MC (10MC Swp)	50MC 52MC 53MC	"	Vert. amp thru detector probe (Fig. 1) to point (A) Low side to chassis.	A3, A4	Remove the .001 capacitor from point (A) and connect a 300Ω carbon resistor from point (A) to chassis using short leads. Adjust A3 & A4 to obtain response curve as in Fig. 2. Repeat steps 1, 2 and 3 until no further improvement is made. Remove the 300Ω resistor and the detector probe. Restore the connection between the FM trap and the channel switch. Replace V5 in its socket.

VIDEO IF TRAP ADJUSTMENT

Connect bias supply as under Antenna Matching Unit Alignment and set for -1 volt at point of application.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	Direct	Across terminals A and B of L15.	39.25MC	Any	DC probe to point (B). Common to chassis.	A5	Adjust for MINIMUM deflection.
5.	"	"	41.25MC	"	"	A6	"
6.	"	"	47.25MC	"	"	A7	"

VIDEO IF ALIGNMENT (SETS USING UHF-VHF TUNER KRK12)

Leave bias supply set to -1 volt.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	Across terminals A and B of L15.	Not used.	43.7MC	Any	Use VTVM. DC probe to point (B) Common to chassis.	A8	Adjust for maximum deflection. Attenuate generator to maintain 1 Volt at VTVM.
8.	"	"	"	45.5MC	"	"	A9	"
9.	"	"	"	41.8MC	"	"	A10	"
10.	.001MFD Ceramic Capacitor	High side to pin 1 (grid) of 6AU6 (V5) Low side to chassis.	43MC (10MC Swp)	41.25MC 42.0MC 45.0MC 45.75MC 46.5MC 47.25MC	"	Vert. amp of scope to point B Low side to chassis.	A11, A12	Shunt R49, R53 and terminals A and F of L21 with 330Ω carbon resistors. Adjust for maximum gain and response similar to Fig. 3. Attenuate generator to maintain .5 Volt peak to peak response on scope.
11.	.0015MFD Ceramic Capacitor	High side to junction of 1N82 crystal and IF grid transformer L12. Low side to tuner case. Use very short shielded leads Loosely couple the marker generator to the scope detector probe.	"	42.5MC 45.75MC 47.25MC	5	Vert. amp thru detector (Fig.1) to pin 5 (Plate) of V5. Low side to chassis.	A14, A15, A16, A17	Connect a 180Ω carbon resistor from terminal "B" of L16 to the junction of R43 and C29B. Preset A15 to minimum capacity. Adjust A14, and A16 for maximum gain at 43.5MC with 45.75MC at 70% of maximum response. Adjust A15 until 42.5MC is at 70% response. Adjust A17 for maximum gain. If necessary readjust A14 and A16 for proper response as in Fig. 5. Disconnect the 180Ω and the three 330Ω resistors.

VIDEO IF ALIGNMENT (SETS USING VHF TUNER KRK11-B

Leave bias supply set to -1 volt.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	Across terminals A and B of L15.	Not used	43.7MC	Any	Use VTVM. DC probe to point (B). Common to chassis.	A8	Adjust for maximum deflection. Attenuate generator to maintain 1 volt at VTVM.
8.	"	"	"	45.5MC	"	"	A9	"
9.	"	"	"	41.8MC	"	"	A10	"
10.	.001MFD Ceramic Capacitor	High side to pin 1 (grid) of 6AU6 (V5). Low side to chassis.	43MC (10MC Swp)	41.25MC 42.0MC 45.0MC 45.75MC 46.5MC 47.25MC	"	Vert. Amp. of scope to point (B). Low side to chassis.	A11, A12	Shunt R49, R53 and terminals A and F of L21 with 330Ω carbon resistors. Adjust for maximum gain and response similar to Fig. 3. Attenuate generator to maintain .5 volt peak to peak response on scope.
11.	.0015MFD Ceramic Capacitor	High side to point (C). Low side to tuner chassis. Use very short shielded leads.	"	41.25MC 41.9MC 44.5MC 45.75MC	5	Vert. Amp. thru detector (Fig. 1) to pin 5 (plate) of V5. Low side to chassis.	A13, A14 A15	Connect a 180Ω carbon resistor from terminal "B" of L16 to the junction of R43 and C29B. Preset A15 to minimum capacity. Adjust A13 and A14 for maximum gain and response similar to Fig. 4. Adjust A15 until 41.25MC is at 85% response with respect to low frequency shoulder at 41.9MC. Disconnect the 180Ω and the three 330Ω resistors.

ALIGNMENT INSTRUCTIONS (CONT.)

SWEEP ALIGNMENT OF VIDEO IF

Connect bias supply as under Antenna Matching Unit Alignment and set for -6 volts at point of application.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	.0015MFD Ceramic Capacitors	High side to point (C) for KRK11B Tuner or to junction of 1N82 crystal and L12 for KRK12 tuner. Low side to tuner chassis. Use very short shielded leads.	43MC (10MC Swp)	42.25MC 42.5MC 45.0MC 45.75MC 46.5MC	Any	Vert. Amp. to point (B). Low side to chassis.		Couple the marker generator loosely to pin 1 (grid) of 6AU6 (V5). Retouch A8 and A9 for response as in Fig. 6 for sets using tuner KRK11B or as in Fig. 7 for sets using tuner KRK12. Do not retouch A10 unless absolutely necessary because of its effect on the level of the sound carrier.

KRK11B TUNER ALIGNMENT

An RF unit which is operative and requires only minor touch-up adjustments requires no presetting of adjustments. Where complete alignment is necessary preset all adjustments to the approximate center of their range with following exceptions:
Set A23 so that the screw head projects approximately 3/8 inch above the chassis.
Set A21 1/4 turn from maximum capacity.
Disconnect the link from terminals A and B of L15 and terminate the link with a 39 ohm carbon resistor.
Connect the potentiometer arm of the bias supply to the AGC terminal on the tuner and the positive lead of the supply to the tuner case.
Adjust for -3.5 volts at point of application.
Tuner alignment as outlined below requires the use of a heterodyne frequency meter.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	.0015MFD	Remove the 6X8 osc. mixer tube from its socket and twist one end of a small piece of wire around pin 7. Replace tube in socket and connect high side of generator to free end of wire. Low side to chassis.	Not used	43.5MC (400~Mod)	2	Vert. Amp. to point (D). Low side to chassis.	A18	Adjust for MINIMUM 400~ indication on scope. Remove wire lead from pin 7 of the 6X8 and replace the tube and shield.
14.		RF input of heterodyne frequency meter to end of insulated wire inserted in hole in tuner, provided for adjustment of A21.	Not used	Set freq. meter to 227MC	8	Not used	A19	Set the fine tuning control 30 degrees clockwise from the center of its mechanical range now and whenever adjusting the oscillator frequency. Adjust for audible beat on frequency meter.
15.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	"	Vert. Amp. to point (D). Low side to chassis.	A20, A21 A22, A23	Set A13 to maximum counter clockwise rotation. Adjust A20, A21, A22 and A23 for response similar to Fig. 8.
16.		Connect frequency meter as in Step 14.	Not used	Freq. meter to 129MC	6	Not used	A24	Adjust for audible beat on frequency meter.
17.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point (D). Low side to chassis.	A25 A26 A27	Adjust for response similar to Fig. 8.
18.	Turn off all generators, connect VTVM to point (D) and chassis and adjust A28 for -3.5 volts or maximum if less than 3.5 volts.							
19.	Repeat Step 17.							
20.	Repeat Step 14.							
21.	Repeat Step 15.							
22.	If A20 was adjusted in step 21 recheck voltage at point (D) as in step 18. If original setting of A28 was far off it may be necessary to alternately perform steps 14, 15 and 18 several times before proper setting is obtained.							
23.		Connect frequency meter as in step 14.	Not used	Freq. meter to 257MC	13	Not used	A29	Adjust for audible beat on frequency meter. Slightly over shoot the adjustment a little more in the same direction from the original setting. Then adjust A19 to again obtain audible beat.
24.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp) 207MC (10MC Swp) 201MC (10MC Swp) 195MC (10MC Swp) 189MC (10MC Swp) 183MC (10MC Swp) 177MC (10MC Swp)	211.25MC 215.75MC 205.25MC 209.75MC 199.25MC 203.75MC 193.25MC 197.75MC 187.25MC 191.75MC 181.25MC 185.75MC 175.25MC 179.75MC	13 12 11 10 9 8 7	Vert. Amp. to point (D). Low side to chassis.		Check for response similar to Fig. 8. If markers fall below 80% switch to channel 8 and readjust A20, A21, A22 and A23 as necessary.
25.		Connect frequency meter as in Step 14.	Not used	Set Freq. meter to 227MC	8	Not used		Check for audible beat on frequency meter. If necessary adjust A19, overshoot the adjustment and correct by adjusting A29.
26.		"	"	Set freq. meter to 129MC	6	"	A24	Adjust for audible beat on freq. meter.
27.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point (D). Low side to chassis.		Check for response as in Fig. 8. If necessary retouch A25, A26 and A27.
28.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2		A13	Adjust A13 clockwise to point where further adjustment causes no change in response curve.

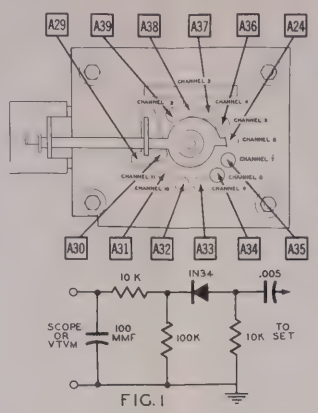


FIG. 1

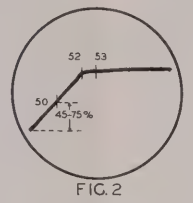


FIG. 2

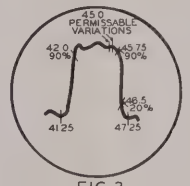


FIG. 3

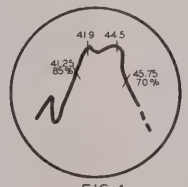


FIG. 4

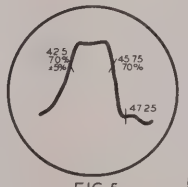


FIG. 5

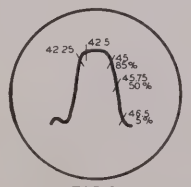


FIG. 6

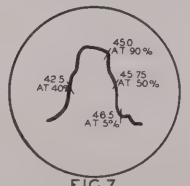


FIG. 7

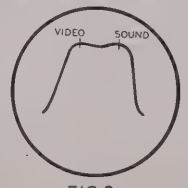


FIG. 8

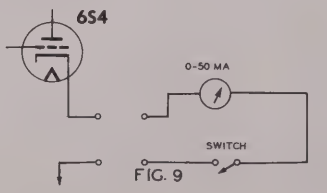


FIG. 9

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
29.	"	"	85MC (10MC Swp) 79MC (10MC Swp) 69MC (10MC Swp) 63MC (10MC Swp) 57MC (10MC Swp)	83.25MC 87.75MC 77.25MC 81.75MC 69.25MC 71.75MC 61.25MC 65.75MC 55.25MC 59.75MC	6 5 4 3 2	"		Check for response as in Fig. 8, and for proper oscillator injection voltage at point (D). If excessive tilt occurs on channels 2, 3 and 4, Adjust A23 on channel 2, overshoot the correction of tilt then adjust A27 on channel 8 for maximum amplitude of response between markers. This should produce flat response on low channels if other adjustments especially A25, are correct.
30.	Check channels 7 thru 13 for proper response as in step 24.							
31.		Connect frequency meter as in step 14.	Not used	Set freq. meter to 257MC	13	Not used		Check for audible beat on frequency meter. Adjust A19 if necessary.
32.		"	"	251MC 245MC 239MC 233MC 227MC 221MC 129MC 123MC 113MC 107MC 101MC	12 11 10 9 8 7 6 5 4 3 2	"	A30 A31 A32 A33 A34 A35 A24 A36 A37 A38 A39	Adjust for audible beat on frequency meter.

KRK12 TUNER VHF ALIGNMENT

It is necessary to meter the non-oscillating plate current of the 6S4 voltage control tube. This can be accomplished by use of an adaptor or similar arrangement. The curcuit diagram for the adaptor is shown in Fig. 9.
Remove the 6S4 from its socket and insert the adaptor plug. Plug the 6S4 into adaptor.
Connect 0-50MA meter to adaptor and turn the switch on.
Remove the tuner cover shield. Set channel selector midway between channels to disable the local oscillator. Some tubes may oscillate even with the tuned circuits disengaged. As a check, short circuit the spring contacts 12 and 13, nearest the tuner front, with a finger. (Contacts are at zero DC potential). If plate current rises keep finger on contacts while adjusting the oscillator voltage control for a 28MA indication on the meter.
Replace tuner cover shield.
The oscilloscope used should have a sensitivity of 1 millivolt per inch. If sensitivity is less, a suitable pre-amplifier may be used with the scope.
A heterodyne frequency meter is used while making VHF oscillator adjustments.
To find oscillator frequency for any VHF or UHF channel add 45.75MC to the video carrier frequency for that channel as listed in the frequency chart.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
33.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	Set sweep to cover channel being aligned. See channel frequency chart.	Set alternately to video and sound carrier frequency of channel being aligned. See chart.	2 thru 13	Vert. amp to point (E) Low side to chassis.	A40, A41, A42, A43 See Remarks	Ground the AGC lines at the tuner terminal board. Turn off the adaptor switch removing plate voltage from oscillator. Adjust for response similar to Fig. 10. Each channel strip adjustment for an individual channel strip has a corresponding adjustment on all other VHF channel strips. Since these adjustments are identical in position and function they are indicated by the same "A" number in the interests of simplification. Adjustments A40, A41 and A42 for each channel strip are accessible through holes in top of tuner as the channel switch is turned to each channel. Adjustment A43 refers to coupling capacitor whose positioning affects the bandwidth of the response curve.
34.	Remove the ground clip placed on the AGC line in above step. Turn the AGC control fully clockwise. Connect the potentiometer arm of the bias supply to the tuner AGC terminal. Connect the positive lead to the tuner case. Adjust for -3.5 volts at AGC terminal. Connect the potentiometer arm of a second bias supply to the ungrounded side of C33. Connect the positive lead to chassis. Adjust for -5 volts at potentiometer arm. Turn the 6S4 adaptor switch on to apply plate voltage to oscillator. Connection of the heterodyne frequency meter for oscillator adjustment is made as follows: Insert the end of an insulated piece of wire into either of two holes next to the oscillator tube at the right top corner of the tuner. Use care so that the wire does not touch any tuned circuits. Connect the other end of the wire to the RF input of frequency meter.							
35.		Connect frequency meter as above.	Not used.	Freq. meter to 257MC	13	Not used .	A44	Adjust for audible beat on Freq. meter.
36.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp)	211.75MC 215.75MC	"	Vert. amp to point B Low side to chassis.		Adjust A17 for maximum gain on scope. Adjust A42 for maximum gain and flat-topped curve. Recheck A17 for maximum gain at center of band.
37.		Connect frequency meter as in step 34.	Not used.	Freq. meter to oscillator frequency channels 12 thru 2. See chart.	12 thru 2	Not used.	A44, A42	Adjust A44 on each channel for audible beat on freq. meter. Connect sweep generator and scope as in step 36, set sweep and marker to proper frequencies for each channel and adjust A42, if necessary for maximum gain and proper response curve.
38.	Direct	High side to point (F) Low side to chassis.	Not used.	43.5MC (400~Mod)	Any	Vert. amp to point B Low side to chassis.	A45	Adjust for MINIMUM 400~ indication on scope.

RCA VICTOR MODELS 21-D-305, U, 21-D-317, U, 21-D-326, U, 21-D-327, U, 21-D-328, U, 21-D-329, U, 21-D-330, U (Ch. KCS81, B)

ALIGNMENT INSTRUCTIONS (CONT.)

KRK12 TUNER UHF ALIGNMENT

Alignment of the UHF portion of the tuner should not be attempted unless the following test equipment is available, in addition to the usual VHF test equipment. A UHF sweep generator covering the range of 470MC to 890MC . A marker generator of crystal accuracy covering the same frequency range.
Leave 684 adaptor connected as under KRK12 Tuner VHF Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
39.	10DB Attenuator pad	Sweep generator thru attenuator to antenna terminals. Couple UHF marker generator loosely to antenna terminals	Set sweep to cover channel being aligned. See chart.	Set alternately to video and sound carrier frequency of channel being aligned. See chart.	14 thru 83	Vert. Amp. to point (E). Low side to chassis.	A46 A47 A48	Turn off the adaptor switch, removing plate voltage from oscillator. Ground the AGC line at the tuner terminal board. Adjust for maximum gain, symmetrical response curve centered about the pass band. See Fig. 11 for acceptable variations.
40.	Connect both bias supplies and adjust as under Tuner VHF Alignment. Remove the ground from the AGC line. Turn the adaptor switch on to apply plate voltage to the oscillator. Connect the VHF signal generator to point (E) using very short leads. Set generator to 45.75MC for remainder of tuner alignment.							
41.	10DB Attenuator pad	Sweep generator thru attenuator to antenna terminals. Connect UHF marker generator to point (E) and tuner chassis.	Set sweep to cover channel being aligned. See chart.	Set to video carrier frequency of channel being aligned See chart	14 thru 83	Vert. Amp. to point (B). Low side to chassis.	A49	Adjust A49 for channel strip being aligned until 45.75MC and video carrier marker coincide on response curve. Adjust A48 of channel strip being aligned for maximum gain with proper wave shape. Connect VTVM to point (F) with common to chassis. Set oscillator injection adjustment for reading on VTVM, between .1 volt and 3 volts on all channel strips.

SOUND IF ALIGNMENT

Turn volume control to maximum.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
42.	.001MFD	High side to pin 1 (grid) of 6AU6 (V12). Low side to chassis.	Not used.	4.5MC (400~Mod)	Any	Use VTVM. DC probe to point (B). Common to chassis.	A50	Adjust for maximum deflection. Adjust generator output to maintain 10 volts at VTVM.
43.	"	"	"	"	"	Connect scope across voice coil. VTVM. DC probe to point (H). Common to chassis.	A51	Adjust A51 for zero reading on VTVM. A positive or negative reading will be obtained on either side of the correct setting. Then adjust A51 to the nearest MINIMUM 400~ indication on on scope.
44.	Repeat adjustments of A50 for maximum deflection and A51 for minimum audio output with final adjustment at an input level to produce 10 volts at VTVM at point (G) .							
45.	Check voltage at point (H) . If in excess of ± 1.5 volts adjust the ratio detector balance control, R8, for zero DC. Readjust A51 for minimum audio output. Repeat adjustments of R8 and A51 until voltage at point (H) is less than ± 1.5 volts when A51 is set for minimum audio output.							
46.	Repeat steps 42 and 45.							
47.	.001MFD	High side to pin 1 (grid) of 6AU6 (V11). Low side to chassis.	4.5MC (1MC Swp)	4.5MC	Any	Vert. amp thru 10KΩ to point (J). Low side to chassis.	A52, A53	Adjust for curve of maximum amplitude and symmetry as in Fig. 12. Attenuate generator to maintain 2 volt peak to peak response.
48.	1000Ω Carbon Resistors	High side to terminal "C" of L27. Low side to chassis.	Not used.	4.5MC	"	Use VTVM. DC probe thru detector (Fig. 1) to pin 6 (Plate) of 6CL6 (V9). Common to chassis.	A54	Short pin 1 of V8 to chassis. Adjust for MINIMUM deflection. Remove short from pin 1 of V8.

FM TRAP ADJUSTMENT

Tune in a TV station on which FM interference is noted and adjust A55 to minimize the interference. On some receivers A55 will tune into channel 6 or 5. Care must be taken to avoid this possibility as reduced sensitivity on these channels will result.

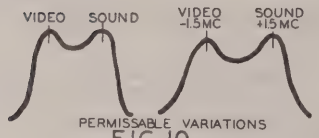


FIG. 10

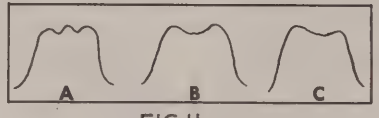


FIG. 11

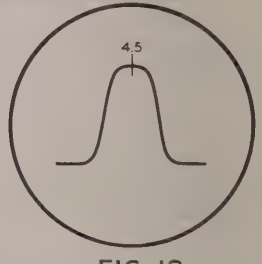
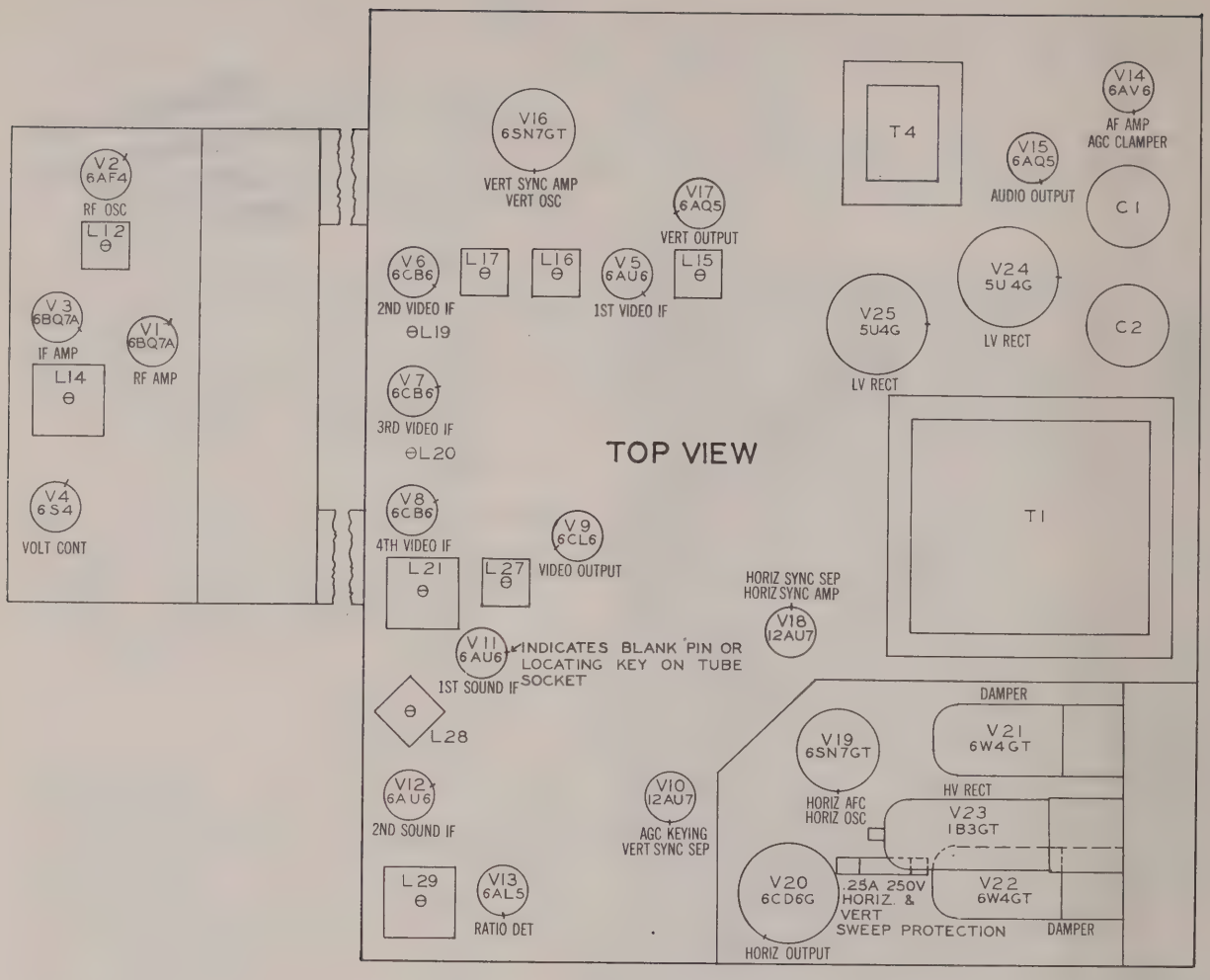


FIG. 12

TELEVISION CHANNEL FREQUENCIES

Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier
2	54-60	55.25	59.75	23	524-530	525.25	529.75	44	650-656	651.25	655.75	64	770-776	771.25	775.75
3	60-66	61.25	65.75	24	530-536	531.25	535.75	45	656-662	657.25	661.75	65	776-782	777.25	781.75
4	66-72	67.25	71.75	25	536-542	537.25	541.75	46	662-668	663.25	667.75	66	782-788	783.25	787.75
5	76-82	77.25	81.75	26	542-548	543.25	547.75	47	668-674	669.25	673.75	67	788-794	789.25	793.75
6	82-88	83.25	87.75	27	548-554	549.25	553.75	48	674-680	675.25	679.75	68	794-800	795.25	799.75
7	174-180	175.25	179.75	28	554-560	555.25	559.75	49	680-686	681.25	685.75	69	800-806	801.25	805.75
8	180-186	181.25	185.75	29	560-566	561.25	565.75	50	686-692	687.25	691.75	70	806-812	807.25	811.75
9	186-192	187.25	191.75	30	566-572	567.25	571.75	51	692-698	693.25	697.75	71	812-818	813.25	817.75
10	192-198	193.25	197.75	31	572-578	573.25	577.75	52	698-704	699.25	703.75	72	818-824	819.25	823.75
11	198-204	199.25	203.75	32	578-584	579.25	583.75	53	704-710	705.25	709.75	73	824-830	825.25	829.75
12	204-210	205.25	209.75	33	584-590	585.25	598.75	54	710-716	711.25	715.75	74	830-836	831.25	835.75
13	210-216	211.25	215.75	34	590-596	591.25	595.75	55	716-722	717.25	721.75	75	836-842	837.25	841.75
14	470-476	471.25	475.75	35	596-602	597.25	601.75	56	722-728	723.25	727.75	76	842-848	843.25	847.75
15	476-482	477.25	481.75	36	602-608	603.25	607.75	57	728-734	729.25	733.75	77	848-854	849.25	853.75
16	482-488	483.25	487.75	37	608-614	609.25	613.75	58	734-740	735.25	739.75	78	854-860	855.25	859.75
17	488-494	489.25	493.75	38	614-620	615.25	619.75	59	740-746	741.25	745.75	79	860-866	861.25	865.75
18	494-500	495.25	499.75	39	620-626	621.25	625.75	60	746-752	747.25	751.75	80	866-872	867.25	871.75
19	500-506	501.25	505.75	40	626-632	627.25	631.75	61	752-758	753.25	757.75	81	872-878	873.25	877.75
20	506-512	507.25	511.75	41	632-638	633.25	637.75	62	758-764	759.25	763.75	82	878-884	879.25	883.75
21	512-518	513.25	517.75	42	638-644	639.25	643.75	63	764-770	765.25	769.75	83	884-890	885.25	889.75
22	518-524	519.25	523.75	43	644-650	645.25	649.75								

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V24, V25

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V7, V8
No pic, no sound, has snow - V1, V2, V3, V4, V5
No pic, has sound, has raster - V9, V26
Has pic, no sound - V11, V12, V13, V14, V15
Overloaded picture - V10, V14

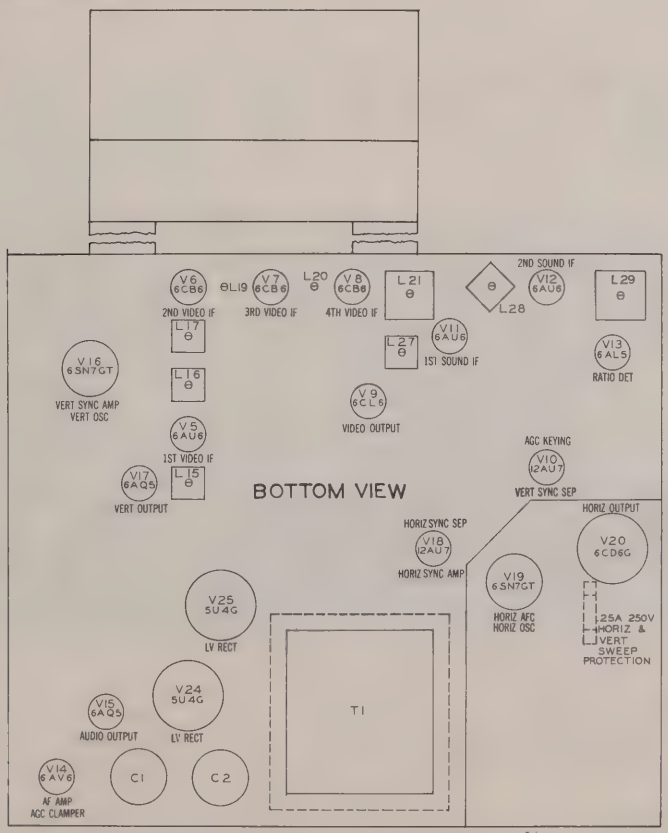
SYNC FAILURE
No vert. sync - V16
No horiz. sync - V18, V19
No vert. or horiz. sync - V10, V18

SWEEP FAILURE
No raster, has sound - V19, V20, V21, V22, V23, V26 Fuse (M1)
No vertical deflection - V16, V17
Poor vert. linearity or foldover - V16, V17
Poor horiz. linearity or foldover - V19, V20, V21, V22
Narrow picture - V19, V20, V21, V22, V23, V24, V25
Vert. off freq. - V16
Horiz. off freq. - V18, V19

RESISTANCE MEASUREMENTS

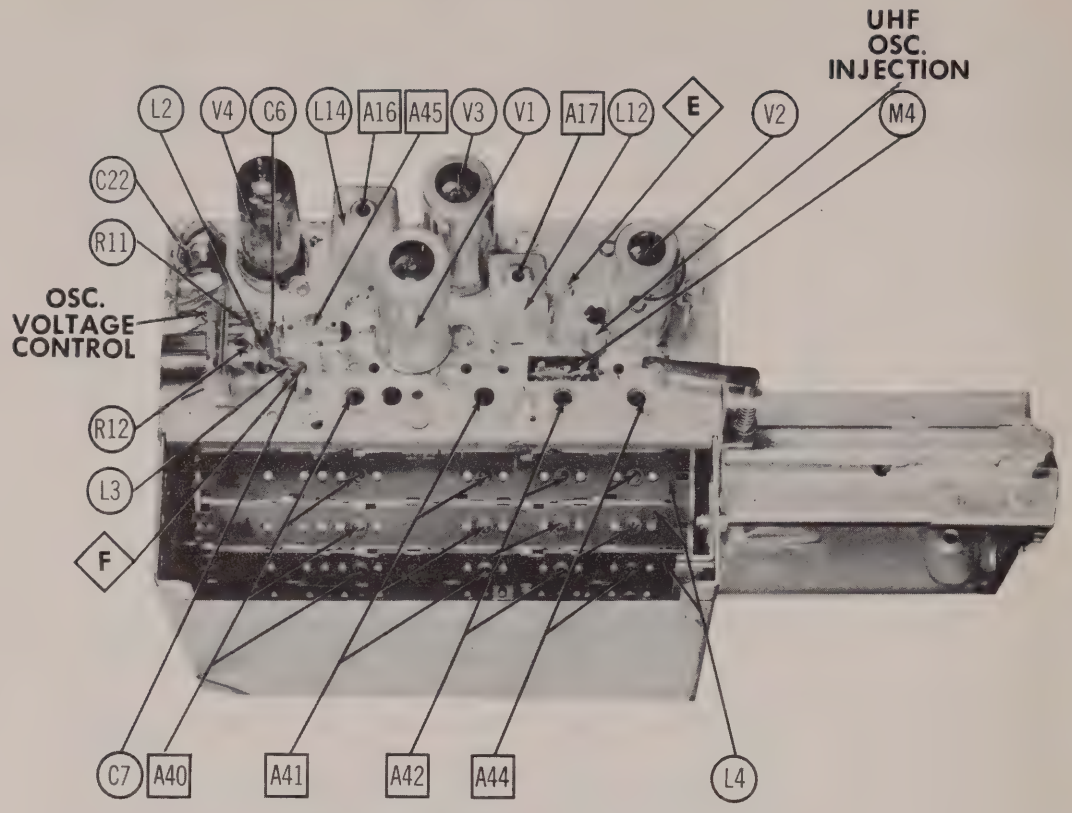
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	†1.8KΩ	8.5Meg	9 Meg	0Ω	.1Ω	9 Meg	580KΩ	120Ω	0Ω
V 2	6AF4	INF	10KΩ	.1Ω	0Ω	0Ω	10KΩ	INF		
V 3	6BQ7A	9 Meg	.1Ω	120Ω	.1Ω	0Ω	†750Ω	8.5Meg	9 Meg	0Ω
V 4	6S4	INF	INF	115KΩ	.1Ω	0Ω	115KΩ	INF	INF	†750Ω
V 5	6AU6	80KΩ	0Ω	0Ω	.1Ω	†17KΩ	†34KΩ	100Ω		
V 6	6CB6	80KΩ	56Ω	0Ω	.1Ω	†2.1KΩ	†34KΩ	0Ω		
V 7	6CB6	.3Ω	68Ω	.1Ω	0Ω	†5.3KΩ	†13KΩ	0Ω		
V 8	6CB6	.3Ω	180Ω	.1Ω	0Ω	†8KΩ	†7KΩ	0Ω		
V 9	6CL6	33Ω	4KΩ	†20KΩ	0Ω	.1Ω	†4KΩ	0Ω	†20KΩ	4KΩ
V 10	12AU7	360KΩ	4 Meg	†3.5KΩ	.1Ω	.1Ω	†680KΩ	4.7Meg	0Ω	0Ω
V 11	6AU6	470KΩ	0Ω	0Ω	.1Ω	#1KΩ	#1KΩ	82Ω		
V 12	6AU6	47KΩ	0Ω	0Ω	.1Ω	#1KΩ	#2KΩ	0Ω		
V 13	6AL5	7.8KΩ	7.8KΩ	.1Ω	0Ω	INF	0Ω	INF		
V 14	6AV6	10Meg	0Ω	0Ω	.1Ω	9.6KΩ	9.6KΩ	†330KΩ		
V 15	6AQ5	490KΩ	6.5KΩ	0Ω	.1Ω	†710Ω	†370Ω	INF		
V 16	6SN7GT	1.2Meg	†38KΩ	15KΩ	1.2Meg	▲510KΩ	110Ω	0Ω	.1Ω	
V 17	6AQ5	3.3Meg	1.2KΩ	0Ω	.1Ω	†1KΩ	†1KΩ	3.3Meg		
V 18	12AU7	†6.8KΩ	†35KΩ	420KΩ	.1Ω	.1Ω	†15KΩ	60KΩ	0Ω	0Ω
V 19	6SN7GT	1.3Meg	40KΩ	250KΩ	260KΩ	†68KΩ	0Ω	0Ω	.1Ω	
V 20	6CD6G	INF	.1Ω	220Ω	INF	1 Meg	220Ω	0Ω	†12KΩ	Top Cap ▲16Ω
V 21	6W4GT	INF	INF	150KΩ	INF	†53Ω	INF	INF	INF	
V 22	6W4GT	INF	INV	150KΩ	INF	†53Ω	INF	INF	INF	
V 23	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ▲300Ω
V 24	5U4G	INF	11KΩ	INF	130Ω	INF	125Ω	INF	11KΩ	
V 25	5U4G	INF	11KΩ	INF	130Ω	INF	125Ω	INF	11KΩ	
V 26	21AP4	0Ω	160KΩ	Pin 10 ▲270KΩ	Pin 11 †115KΩ	Pin 12 .1Ω				

ALL MEASUREMENTS TAKEN IN VHF POSITION ONLY
† MEASURED FROM PIN 8 OF V24 & V25.
▲ MEASURED FROM PIN 3 OF V21.
MEASURED FROM 125 VOLT DC LINE

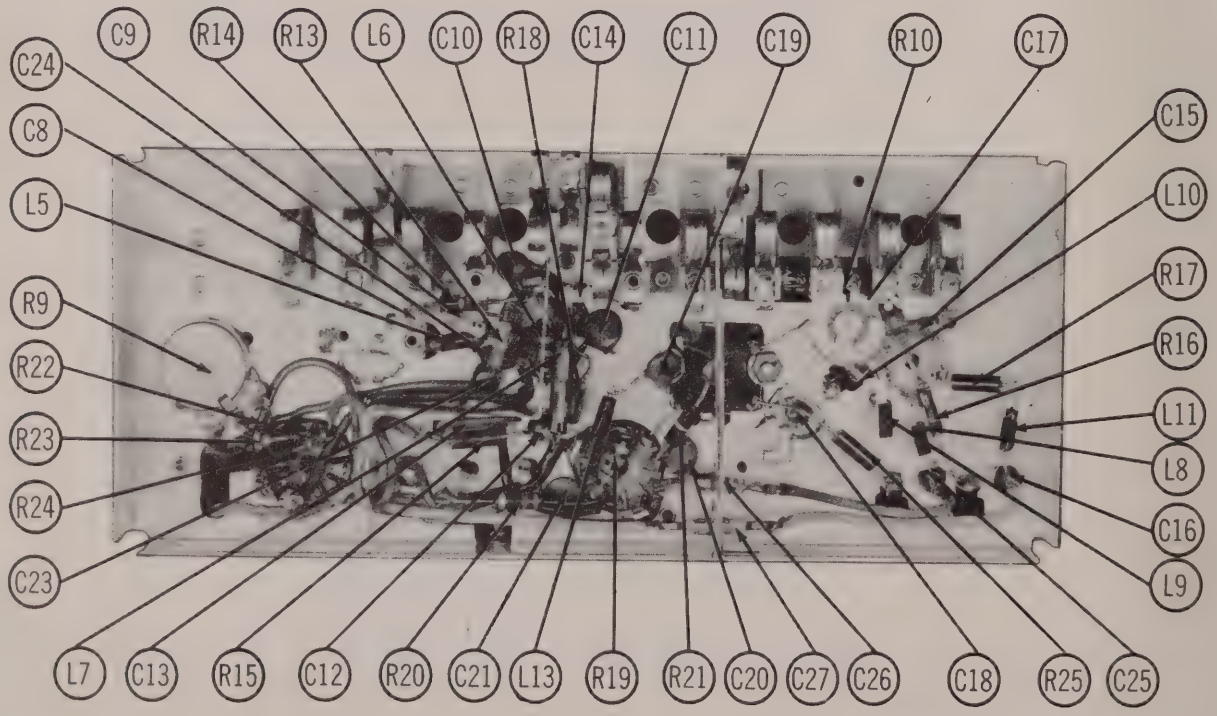


TUBE PLACEMENT CHART

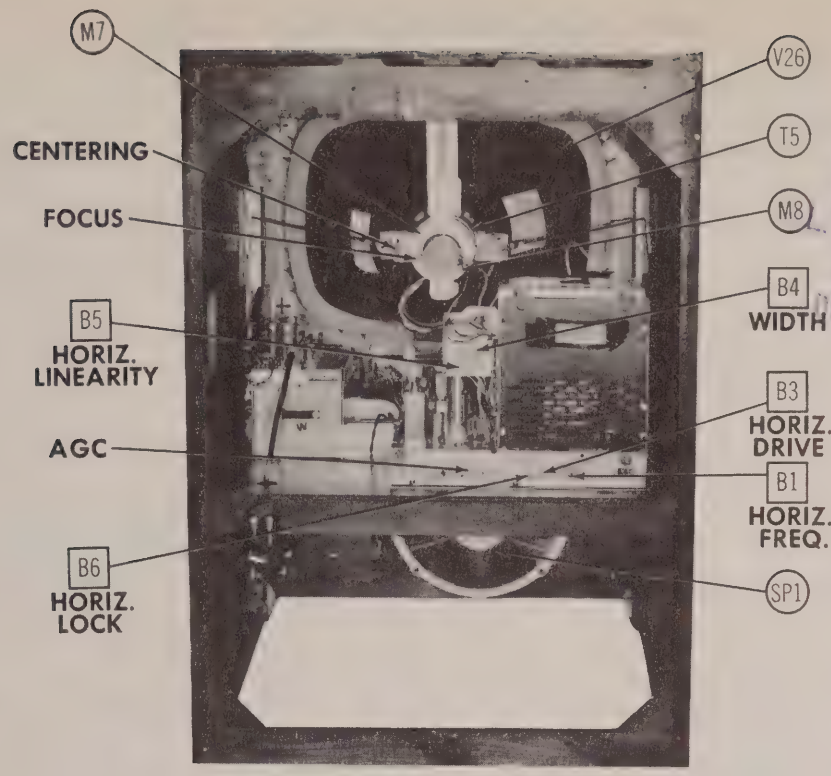
UNIVERSITY OF COLORADO



RF TUNER – TOP VIEW



RF TUNER – BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL FREQUENCY ADJUSTMENT

Turn the set on and tune in a TV station, preferably a test pattern.

If the picture cannot be synchronized horizontally with the horizontal hold control, adjust the horizontal frequency slug (B1) until the picture will synchronize. If picture still will not synchronize adjust the horizontal waveform slug (B2) several turns out of the coil and readjust B1 to synchronize the picture.

If picture width or linearity is incorrect, adjust the horizontal drive trimmer (B3) , the width control slug (B4), and the horizontal linearity control slug (B5) for proper results.

HORIZONTAL WAVEFORM ADJUSTMENT

The horizontal waveform adjustment is made at the factory and normally will not require readjustment. B1 and B2 are adjusted simultaneously while watching the picture. Set the horizontal hold control fully clockwise. Turn B1 until picture falls out of sync and one diagonal black bar sloping down to the right appears on the screen.

Turn B2 clockwise, at the same time adjusting B1 to maintain one bar on the screen.

Continue adjusting B1 and B2 in such manner until the oscillator begins to motorboat, then adjust B2 counter clockwise until the motorboating stops. To check adjustment turn B1 until the picture synchronizes then reverse the direction of core rotation until the picture falls out of sync with diagonal bars sloping down to the right.

Continue to turn B1 in the same direction.

Additional bars should not appear on the screen.

Instead, the horizontal oscillator should start to motorboat. Retouch B2 until this condition is obtained. To observe the horizontal waveform connect the low capacity probe of an oscilloscope to terminal C of L30.

Turn the horizontal hold 1/4 turn from counter clockwise so that the picture is in sync.

The waveform on the scope should appear as in Fig. 13. Adjust B2 for broad and narrow peaks of equal height. If necessary while adjusting B2 keep the picture in sync with the horizontal hold control.

HORIZONTAL LOCKING RANGE ADJUSTMENT

With the horizontal hold control in full counter clockwise position momentarily interrupt the signal by switching off channel and back.

If picture remains in sync turn B1 slightly and again switch off channel, repeating until picture loses sync, with diagonal lines sloping down to the left . Slowly turn the horizontal hold control clockwise and note the least number of bars obtained just before the picture pulls into sync. If the number is more than 3 adjust the horizontal locking trimmer (B6) slightly clockwise. If the number is less than 2 adjust B6 counter clockwise.

Recheck as above for the least number of bars and readjust B6, if necessary, until 2 or 3 bars are present. Turn the horizontal hold control fully clockwise and adjust B1 until the diagonal bar sloping down to the right appears on the screen, then reverse the direction of adjustment of B1 until the diagonal bar just disappears, leaving the picture in synchronization.

AGC CONTROL ADJUSTMENT

This control is adjusted at the factory and normally should not require readjustment.

To check the operation of the control, tune in a strong signal and synchronize the picture.

Momentarily switch to another channel and back again. If the picture reappears immediately, the receiver is not overloading due to improper setting of the control. If the picture requires an appreciable portion of a second to reappear, or distorts, the control should be readjusted.

Turn the control fully counter clockwise .

The raster may be bent slightly, but this should be disregarded. Turn the control clockwise until there is a very slight bend or change of bend in the picture. Then turn the control counter clockwise just enough to remove the bend or change in bend.

If the signal is too weak to cause the picture to bend turn the control clockwise until snow in the picture becomes more pronounced, then counter clockwise until best signal to noise ratio is obtained.

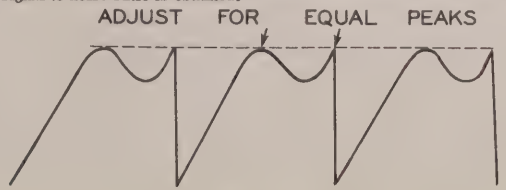


FIG. 13

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP (Fig. 1)

Check yoke. Check soldier connections in yoke, yoke plug and socket.

INSUFFICIENT SWEEP

Check by substitution V19, C20, V21, V22, V23, V24 and V25.
Check amplitude of waveform W15;

If Insufficient	If Sufficient
Check components of V19. Check C100 and R137.	Check Components of V20, V21 & V22, especially R138, R139, R140, C101 and C102.

DRIVE LINES

Check by substitution V19 and V20. Check C100 and B3 (horizontal drive control).

COMPRESSED AT LEFT SIDE

Substitute V20, V21 and V22. Check waveform W15;

If Unsatisfactory	If Satisfactory
Check coupling network between V19 and V20.	Check T3 and T6. Check associated components.

FOLDS

Substitute V21 and V22. Check C104, C105, and C96. Check associated components.

VERTICAL

LOSS OF SWEEP

Check V16 and V17. Check waveform W9;

If Unsatisfactory	If Satisfactory
Check components of vertical oscillator and coupling capacitor C78.	Check R6, R115, R116, R117, T4 and associated components.

INSUFFICIENT SWEEP

Substitute V16 and V17. Check associated components, especially C4 for leakage and C77 for open.

COMPRESSED AT BOTTOM

Substitute V16 and V17. Check C2D for open and C77 for leakage.

COMPRESSED AT TOP

Substitute V16 and V17. Check coupling network between V16 and V17.

COMPRESSED AT TOP, STRETCHED AT BOTTOM

Check C77 for leakage. Check V17 and yoke components.

FOLDS

Substitute V17. Check T5 and components.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V10, V18 and V19. Check waveform W12;

If Unsatisfactory	If Satisfactory
Check components of V10B and V16A. Check coupling from V18 and V19.	Check V19 components, particularly C96 for leakage and C94 for open.

CRITICAL SYNC

Check C95 for open.

PULLING PICTURE

Check C91 and C95 for open. Fig. 2 results from C94 being open.

VERTICAL

LOSS OF SYNC

Substitute V10, V18 and V16. Check waveform W8.

If Unsatisfactory	If Satisfactory
Check components of V10 and V18. Check coupling network between V18 and V16.	Check components of V16, Check wave-shaping network between V16 and V17.

CRITICAL SYNC

Substitute V10, V18 and V16. Check associated components for change in values.

TRIGGERING

Substitute V16. Check filament lead dressing around grid circuit.

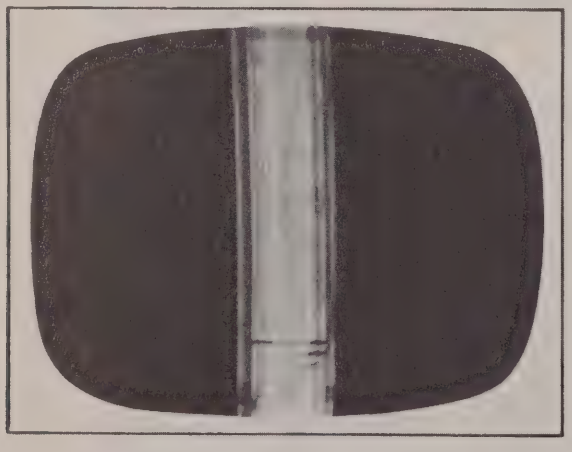


Fig. 1 LOSS OF SWEEP
See HORIZONTAL SWEEP

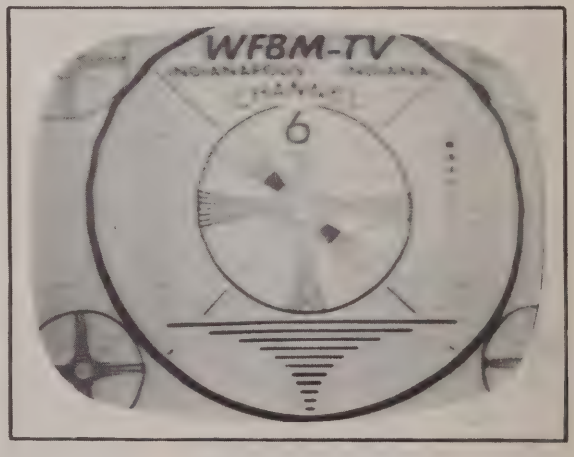


Fig. 2. PULLING PICTURE
See HORIZONTAL SYNC

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7A	6BQ7A	9AJ	
V2	RF Oscillator	6AF4	6AF4		
V3	IF Amplifier	6BQ7A	6BQ7A	9AJ	
V4	Voltage Control	6S4	6S4	9AC	
V5	1st. Video IF Amp.	6AU6	6AU6	7BK	
V6	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V7	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V8	4th. Video IF Amp.	6CB6	6CB6	7CM	
V9	Video Output	6CL6	6CL6		
V10	AGC Keying-Vert. Sync Sep.	12AU7	12AU7	9A	
V11	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V12	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V13	Ratio Detector	6AL5	6AL5	5BT	
V14	AF Amplifier-AGC Clamper	6AV6	6AV6	7BT	
V15	Audio Output	6AQ5	6AQ5	7BZ	
V16	Vert. Sync Amp. - Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V17	Vert. Output	6AQ5	6AQ5	7BZ	
V18	Horiz. Sync Sep.-Horiz. Sync Amp.	12AU7	12AU7	9A	
V19	Horiz. AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V20	Horiz. Output	6CD6G	6CD6G	5BT	
V21	Damper	6W4GT	6W4GT	4CG	
V22	Damper	6W4GT	6W4GT	4CG	
V23	HV Rectifier	1B3GT	1B3GT	3C	
V24	LV Rectifier	5U4G	5U4G	5T	
V25	LV Rectifier	5U4G	5U4G	5T	

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[illegible]

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V23	21AP4	21AP4		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲35	450	76485	AFH4-16		D103		FP445	TVL-4755	
B	10	200		PRS250/4				TC50X		
C	■35	450								
D	▲10	450								
C2A	▲35	450	76486	AFH4-82		D104		FP432.9	TVA-4714	
B	■25	450						TC74		
C	▲20	200								
D	100	50								
C3A	▲70	450	77657	AFH4-16		D015		FP450	TVL-4780	
B	■10	450		PRS450/10		BR1015A				
C	▲10	450								
D	5	450								
C4	5	450	28417	PRS450/4		BR445		TC70	TVA-1702	
C5	5	50	74521	PRS150/4		BR550		TC30	TVA-1303	
C6	56				TCN-56					
C7	56				TCN-56					
C8	6		74182				NP0K-060			
C9	2		77210		TCZ-2					
C10	680		77624	BPD-00068	D6-681		GP2K-681	UC-5368	5GA-T68	
C11	1000		77252	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C12	1000		77615	CS-1B-001	S1-102		324-102	SC-521	505C-D1	
C13	10000		73960	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C14	56		71924		TCZ-56					
C15A	2		77667							
B	22									
C16	1000		77615	CS-1B-001	S1-102		324-102	SC-521	505C-D1	
C17	22		77621							
C18	1000		77084	CN-1-001	MFT-1000				503C-D1	
C19	220		77625	BPD-00022	D6-221		GP2K-221	UC-5322	5GA-T22	
C20	1000		77252	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C21	1000		77252	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C22	470		77293	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C23	1000		77615	CS-1B-001	S1-102		324-102	SC-521	505C-D1	
C24	1000		77252	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C25	1000		77615	CS-1B-001	S1-102		324-102	SC-521	505C-D1	
C26	1000		77084	CN-1-001	MFT-1000				503C-D1	
C27	1000		77084	CN-1-001	MFT-1000				503C-D1	
C28	4700		73473	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C29A	4700		76470	BPD-2X0047	DD-2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	4700					TM5D5	811-005	DC-525		
C30	4700		73473	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C31	.1	400	73551	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C32	4700		73473	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C33	.22	200	73794	P488-22		PTE4P22		PT4025	2TM-P22	
C34A	4700		76470	BPD-2X0047	DD-2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	4700					TM5D5	811-005	DC-525		
C35	4700		73473	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C36A	4700		76470	BPD-2X0047	DD-2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	4700					TM5D5	811-005	DC-525		
C37	4700		73473	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C38	1500		75166	CS-1B-0015	S1-152		324-152		501C-D15	
C39	4700		734 73	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C40A	4700		76470	BPD-2X0047	DD-2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	4700					TM5D5	811-005	DC-525		
C41	10000		73960	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C42	47		39042	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C43	15		39044		TCN-15		N750K-150		5TCV-Q15	
C44	.0082	400	73808							
C45	.22	400	73794	P488-22		PTE4P22		PT4025	4TM-P22	
C46	.22	400	73794	P488-22		PTE4P22		PT4025	4TM-P22	
C47	1500		73748	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C48	.0027	600	73599	P688-003	D6-272	PTE6D3	GP2-333-272	PT623	6TM-D3	
C49	220	1000	75248					MCK322	10GAB-T22	
C50	39	3500	76574							
C51	.22	200	73794	P488-22		PTE4P22		PT4025	2TM-P22	
C52	.22	200	73794	P488-22		PTE4P22		PT4025	2TM-P22	
C53	.22	200	73794	P488-22		PTE4P22		PT4025	2TM-P22	
C54	10000		73960	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C55A	10000		75877	BPD-01	DD-3-103	TM5DS1	811-01	DC-511	5HK-3S1	
B	10000			BPD-01			811-01	DC-511		
C56	56		71924		TCN-56		N750L-560			
C57A	10000		75877	BPD-01	DD-3-103	TM5DS1	811-01	DC-511	5HK-3S1	
B	10000			BPD-01			811-01	DC-511		
C58	470	500	39644	1469-0005		5RST5		MCB345	MS-35	
C59	470	500	39644	1469-0005		5RST5		MCB345	MS-35	
C60	.0022	600	73595	P688-0022	D6-222	PTE6D22	GP2-333-202	PT6322	6TM-D22	
C61	.0047	600	73920	P688-0047	D6-472	PTE6D47	811-005	PT6247	6TM-D47	
C62	.022	200	73562	P488-022		PTE4S22		PT4122	4TM-S22	
C63	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C64	.0027	600	73599	P688-003	D6-272	PTE6D3	GP2-333-272	PT623	6TM-D3	
C65	270		47617		TCN-270		N750L-271			
C66	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C67	.0027	600	73599	P688-003	D6-272	PTE6D3	GP2-333-272	PT623	6TM-D3	
C68	330	500	39640	1469-00035				MCB335	MS-335	
C69	.047	400	73553	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C70	270	500	39638	1469-0003		5RST3		MCB241	MS-33	
C71	.033	400	73552	P488-033				PT4133		
C72	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C73	100		39396	SI00N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C74	100		39396	SI00N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C75	100		39396	SI00N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C76	.0047	600	73920	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6347	6TM-D47	
C77	.1	600	73557	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C78	.22	600	74957	684-25		PTE6P25		PT6025	6TM-P25	
C79	.0022	1000	73803	P1068-0022		PTE16D22		PT16222	MB-D22	
C80	.022	400	73562	P488-022		PTE4S22		PT4122	4TM-S22	
C81	.022	400	73562	P488-022		PTE4S22		PT4122	4TM-S22	
C82	.1	600	73557	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C83	.022	600	73798	P688-022		PTE6S22		PT6122	6TM-S22	
C84	.1	400	73551	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C85	.0068	400	73789	P488-0068	D6-682	PTE4D68	GP2-333-682		6TM-D68	
C86	.0082	400	73808							
C87	.0047	400	73920	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6347	6TM-D47	
C88	270		47617		TCN-270		N750L-271			
C89	.0047	400	73920	P688-0047	D6-472	PTE6D47	GP2-333-472		6TM-D47	
C90	120		71614		TCN-120		N750L-121			
C91	82	1000	76474						10GAB-Q82	
C92	82	1000	76474						10GAB-Q82	
C93	.047	400	73553	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C94	.47	200	73798	P288-47		PJ2P5		PT405	2TM-P47	
C95	.022	400	73562	P488-022		PTE4S22		PT4122	4TM-S22	
C96	.047	400	73553	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C97	270	1000	76579					MCK327	10GAB-T27	
C98	.01	600	73594							
C99	.0013	600	77727							
C100	.001	1000	75643	P1068-001		PTE16D1		PT1621	MB-D1	
C101	.047	600	73592	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C102	.47	200	73787	P288-47		PJ2P5		PT405	2TM-P47	
C103	33	6000	76577						60GAB-Q33	
C104	.068	1000	73815	P1068-068						
C105	.068	1000	73815	P1068-068						
C106	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C107	150	2000	76576	HVD30-00015	D30-151				20GAB-T15	
C108	500	30000	76488							
C109	180	3500	76575							
C110	10	HV		HVD30-00001		TM60Q1			30GAB-Q1	
C111	56	HV								
C112	.047	400		689ZX-05		PJ4S5		PT4147	4TM-S47	Note 1
C113	.047	400		689ZX-05		PJ4S5		PT4147	4TM-S47	Note 1
C114A	4700		76470	BPD-2X0047	DD-2-502	TM5D5	811-005	DC-525	5HK-2D47	Note 2
B	4700					TM5D5	811-005	DC-525		
C115A	4700		76470	BPD-2X0047	DD-2-502	TM5D5	811-005	DC-525	5HK-2D47	Note 2
B	4700					TM5D5	811-005	DC-525		
C116	.047	400	73553	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	Note 2

Note 1. Some Models use .01MFD in this application (Part #73594).
Note 2. Not used in Ch. KCS81B.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	RCA Victor PART No	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	200KΩ		77655	QJ-477 *	RTV-406		UF254L	Brightness - Panel
B	1Meg						UR18-T25 †	Volume - tapped ④200KΩ-Rear
C	Switch						US-26	Attach to R1B
R2	15KΩ		76445	QJ3-1SXX				Contrast-tapped ⑤ 4875Ω &10KΩ
R3A	75KΩ		77639	QJ1-125	AG-47-S	AB-35	U-41	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	1500Ω		77653	QJ1-110	AG-11-S	AB-6	U-6	Vert. Linearity
B	Shaft		Not Req.	SQ	KSS-3	AK-1	Not Req.	Attach to R4A
R5A	2.5Meg		77640	QJ1-239	AG-84-S	AB-83	U-255	Height
B	Shaft		Not Req.	SQ	KSS-3	AK-1	Not Req.	Attach to R5A
R6A	850KΩ		77652	QJ1-137	AG-61-S	AB-69	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R6A
R7A	200KΩ		77654	QJ1-129	AG-52-S	AB-46	U-43	AGC
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8	2500Ω		77199					Ratio Detector Balance
R9	100KΩ		77614					Oscillator Voltage

† Universal Replacement (Mallory exact duplicate part #UE13608)
* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-129 & P1-200 (panel) B13-137X & R1-216 (Rear) & SWITCH 76-1

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	IRC PART No.	NOTES
R10	47Ω	½	503047		
R11	180KΩ	½		BTS-180K	
R12	180KΩ	½		BTS-180K	
R13	22KΩ	½	503322	BTS-22K	
R14	120Ω	½	503112	BTS-120	
R15	1000Ω	½	503210	BTS-1000	
R16	10KΩ	½	503310		
R17	1000Ω	½	503210	BTS-1000	
R18	8.2Meg	½	503582	BTS-8.2Meg	
R19	470KΩ	½	503447		
R20	8.2Meg	½	503582		
R21	120Ω	½	503112	BTS-120	
R22	120KΩ	½	503412	BTS-120K	
R23	270KΩ	½	503427		
R24	100Ω	½	503110	BTS-100	
R25	100Ω	½	503110	BTS-100	
R26	100Ω	½	503110	BTS-100	Note 1
R27	4000Ω	7	77668	1 3/4A-7000	Note 1
R28	10KΩ	5	77669	1 3/4A-10K	Note 1
R29	3.6 Meg 5%	1	512536	BTA-3.6Meg 5%	
R30	10KΩ	½	503310	BTS-10K	
R31	270KΩ 5%	½	502427	BTS-270K 5%	
R32	100KΩ	½	503410	BTS-100K	
R33	270KΩ 5%	½	502427	BTS-270K 5%	
R34	10KΩ	½	503310	BTS-10K	
R35	82KΩ 5%	½	8064	BTS-82K 5%	
R36	1000Ω	½	503210	BTS-1000	
R37	1000Ω	½	503210	BTS-1000	
R38	8.2Meg	½	503582	BTS-8.2Meg	Note 1
R39	120KΩ	½	503412	BTS-120K	Note 1
R40	47KΩ	½	503347	BTS-47K	Note 1
R41	100Ω 5%	½	502110	BTS-100 5%	
R42	33KΩ	½	503333	BTS-33K	
R43	1000Ω	½	503210	BTS-1000	
R44	33KΩ	½	503333	BTS-33K	
R45	1000Ω	½	503210	BTS-1000	
R46	56Ω 5%	½	502056	BTS-56 5%	
R47	33KΩ	½	503333	BTS-33K	
R48	1000Ω	½	503210	BTS-1000	
R49	56000Ω 5%	½	502256	BTS-5600 5%	
R50	68Ω 5%	½	34763	BTS-68	
R51	10KΩ	½	503310	BTS-10K	
R52	2200Ω	½	503222	BTS-2200	
R53	56KΩ 5%	½	502356	BTS-56K 5%	
R54	180Ω	½	503118	BTS-180	
R55	8200Ω	½	503282		
R56	18KΩ	½	503318		
R57	6800Ω	1	513268	BTA-6800	
R58	39000Ω 5%	½	502339	BTS-3900 5%	
R59	33Ω	½	503033	BTS-33	
R60	220Ω	½	503122		
R61	4700Ω	½	503247	BTS-4700	
R62	15KΩ	2	523315	BTB-15K	
R63	6750	10	76642		
R64	680Ω	½	503168	BTS-680	
R65	5600Ω	1	513256	BTA-5600	
R66	10KΩ	1	513310	BTA-10K	
R67	150KΩ	½	503415	BTS-150K	
R68	1000Ω	½	503210	BTS-1000	
R69	470KΩ	½	503447	BTS-470K	
R70	150KΩ	½	503415	BTS-150K	
R71	100KΩ	½	503410	BTS-100K	
R72	470KΩ	½	503447		
R73	82Ω 5%	½	502082	BTS-82 5%	
R74	1000Ω	½	503210	BTS-1000	
R75	47KΩ	½	503347		
R76	33KΩ	½	503333	BTS-33K	
R77	1000Ω	½	503210	BTS-1000	
R78	56KΩ	½	503356	BTS-56K	
R79	47Ω	½	503047	BTS-47	
R80	39KΩ	½	503339	BTS-39K	

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	IRC PART No.	NOTES
R81	1000Ω	½	503210	BTS-1000	
R82	6800Ω 5%	½	14659	BTS-6800 5%	
R83	6800Ω 5%	½	14659	BTS-6800 5%	
R84	15KΩ	½	503315	BTS-15K	
R85	10Meg	½	503610	BTS-10Meg	
R86	330KΩ	½	503433	BTS-330K	
R87	470KΩ	½	503447	BTS-470K	
R88	330Ω	1	513133	BTA-330	
R89	330Ω	1	513133	BTA-330	
R90	680KΩ	½	503468	BTS-680K	
R91	4.7Meg	½	503547	BTS-4.7Meg	
R92	470KΩ	½	503447	BTS-470K	
R93	270KΩ	½	503427	BTS-270K	
R94	27KΩ	½	503327	BTS-27K	
R95	27KΩ	½	503327	BTS-27K	
R96	6800Ω	½	503268	BTS-6800	
R97	3.9Meg	½	503539	BTS-3.9Meg	
R98	220KΩ 5%	½	502422	BTS-220K 5%	
R99	1Meg	½	503510	BTS-1Meg	
R100	22KΩ	½	503322	BTS-22K	
R101	39KΩ	½	503339	BTS-39K	
R102	8200Ω	1	513282	BTA-8200	
R103	18000Ω 5%	½	502318	BTS-1800 5%	
R104	220KΩ	½	503422	BTS-220K	
R105	1Meg	½	503510	BTS-1Meg	
R106	33KΩ	½	503333	BTS-33K	
R107	100KΩ	½	503410	BTS-100K	
R108	15KΩ	½	503315	BTS-15K	
R109	470KΩ	½	503447	BTS-470K	
R110	470KΩ	½	503447	BTS-470K	
R111	1.2Meg 5%	½	502512	BTS-1.2Meg 5%	
R112	470KΩ	½	503447	BTS-470K	
R113	6800Ω 5%	1	512268	BTA-6800 5%	
R114	220KΩ	½	503422	BTS-220K	
R115	150KΩ	½	503415	BTS-150K	
R116	3.3Meg	½	503533	BTS-3.3Meg	
R117	560Ω	½	503156	BTS-15K	
R118	68KΩ 5%	1	512368	BTA-68K 5%	
R119	470Ω	½	503147	BTS-470	
R120	10KΩ	½	503310	BTS-10K	
R121	3300Ω	½	503233	BTS-3300	
R122	560Ω	½		BTS-560	
R123	39KΩ	½	503339	BT-39K	
R124	56KΩ	½	503356	BTS-56K	
R125	150KΩ	½	503415	BTS-150K	
R126	330KΩ	½	503433	BTS-330K	
R127	820KΩ	½	503482	BTS-820K	
R128	68KΩ	½	503368	BTS-68K	
R129	180KΩ	½	503418	BTS-180K	
R130	3900Ω	½	503239	BTS-3900	
R131	82KΩ	1	513282	BTA-82K	
R132	10KΩ	½	503310	BTS-10K	
R133	39KΩ	½	503339	BTS-39K	
R134	68KΩ	1	513368	BTA-68K	
R135	390KΩ	½	503439	BTS-390K	
R136	330KΩ	½	503433	BTS-330K	
R137	1Meg	½	503510	BTS-1Meg	
R138	47KΩ	½	503047		
R139	220Ω	5			Note 2
R140	27KΩ	2	523327	BTB-27K	
R141	22KΩ	2	523327	BTB-22K	
R142	270KΩ	½	503427	BTS-270K	
R143	1.5Ω	4	76468		
R144A	600Ω	16			
B	500Ω	6			
C	2000Ω	5			
D	1200Ω	1	77651		
E	10KΩ	5			
F	7000Ω	5			
R145	100KΩ	½	503410	BTS-100K	

Note 1. Used only with Ch. #KCS81.
Note 2. Some Models use a 100Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC	646VCT	5VAC	6.3VAC	77649	P-8166 ①		TP-356		
	② 2.6A	.360ADC	③ 6A	② 2.4A						
				SEC 4						
				6.3VAC						
				② 10.1A						

① Parallel the two 6.3V, 5A windings and use as Sec. 4.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	800ΩTap		77650						Vert. Osc. Trans.
	① 130Ω								
T3	30ΩTap	0Ω	76501 ①						Horiz. Output Trans.
	② 16Ω		76672 ②						
T4	620Ω	.6Ω	76494	A-8140 ③	A-3080 ③	TSO-6 ③	A-103X		Vert. Output Trans.
T5A	25Ω		76653 ④	DY-10A ⑤	MDF-30⑤	TY-4 ⑤	Y-20 ⑤		Horiz. Deflection Coils.
B	3.3Ω								Vert. Deflection Coils.
T6	12Ω		76483		MWC-2 ⑥	TL-3 ⑦	WC-11 ⑥		Horiz. Lin. Coil
T7	120Ω		76484						Width Coil

① Horiz. output trans. less fil. winding.
② Horiz. output trans. fil. winding.
③ Drill new mounting holes.
④ Complete with male connector plug.
⑤ Use original deflection coil network.
⑥ Enlarge mounting hole.
⑦ Do not use tap.
⑧ Connect to coded green & black dot terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T8	6.5KΩ	3.7Ω	340Ω	.44Ω	76997	A-3678 ①	A-2930 ①	RO-301 ①	S-5X ①	⑤ Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	RCA Victor PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP 1	12"	PM	3.7Ω	76093	12J11	12A31	

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.260ADC	41Ω	1.06 Hy.	77675	C-2326 ①	C-2896 ①	TR-1733 ①	C-17X ①

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L3	IF Trap	0Ω		77626				
L3	IF Trap	0Ω		77626				
L4A	VHF Ant.,RF Mixer & Osc. Coils	0Ω		77602				Channels 2-4, Includes capacitors
B	VHF Ant.,RF Mixer & Osc. Coils	0Ω		77603				Channels 5-6, Includes capacitors
C	VHF Ant., RF Mixer & Osc. Coils	0Ω		77604				Channels 7-10, Includes capacitors
D	VHF Ant.,RF Mixer & Osc. Coils	0Ω		77605				Channels 11-13, Includes capacitors
E	UHF Ant., RF Mixer & Osc. Coils	0Ω						Channels 14-52, Includes capacitors
F	UHF Ant., RF Mixer Osc. Coils	0Ω						Channels 53-83, Includes capacitors
L5	IF Trap	.3Ω		77628				
L6	Neutr.Coil	0Ω		77627				Wound on 470KΩ resistor
L7	RF Choke	2Ω		77695				11 Microhenries
L8	Fil. Choke	0Ω		77631				
L9	Fil. Choke	0Ω		77632				
L10	Cathode Choke	0Ω		77629				
L11	RF Choke	0Ω		77630				
L12	UHF-VHF IF Input Trans.	.1	.1Ω	77609				
L13	Feedback Coil	1.6Ω		77634				
L14	UHF-VHF IF Output Trans.	.3Ω	.1Ω	77610				Includes 10KΩ resistor
L15	1st.Video IF Grid	.1Ω	.2Ω	77198	17-4531		6216	Includes trap & 5.6KΩ resistor
L16	1st.Video IF Plate	.2Ω		77197			6217	Includes 4.7KΩ resistor, 100MMF capacitor & trap
L17	2nd.Video IF Grid	.2Ω		76435			6218	Includes Trap
L18	Fil. Choke	0Ω		73477			4604	1.36 Microhenries
L19	2nd.Video IF Plate	.3Ω	.3Ω	76433	17-4523		6219	
L20	3rd.Video IF	.3Ω	.3Ω	76433	17-4523		6219	
L21	4th. Video IF	.3Ω	.3Ω	76436				Includes 10KΩ resistor, IN64 Crystal detector, 10MMF capacitor & 36 Microhenries series peaking coil
L22	Series Peaking Coil	6.5Ω		76646	19-3075 *	TV-181 *	6172 *	72 Microhenries, wound on 3.3KΩ resistor
L23	Shunt Peaking Coil	11.5		75252	19-3500	TV-188	6174	500 Microhenries
L24	4.5MC Trap	2.4Ω		76482	20-1004 †	TV-151 †	1470 †	Wound on 47MMF Capacitor
L25	Shunt Peaking Coil	16.5Ω		75252	19-3500	TV-188	6174	500 Microhenries
L26	Series Peaking Coil	6.8Ω		76647	19-3180 ▲	TV-184 ▲	6179	180 Microhenries, wound on 22KΩ resistor
L27	1st.Sound IF	6.8Ω		76437	17-1025			10MMF Capacitor, tapped ④ 5.5Ω
L28	2nd.Sound IF	5.5Ω	3.5Ω	76438	17-1021	TV-113 **	1466 ■	
L29	Ratio Det.	4.2Ω	.4Ω CT	76439	17-1033	TV-110	1468	Tertiary Winding -.8Ω
L30	Horiz. Osc.	80Ω		76440	20-1402	TV-162	6183	Tapped ④ 55Ω, Horiz. waveform winding -45Ω
L31	RF Choke	2.8Ω		76510			4608	4.7 Microhenries (IRC part #CL-1)
L32	RF Choke	.72Ω		76640			4604	1.5 Microhenries (IRC part #CL-1)
L33	RF Choke	.72Ω		76640			4604	1.5 Microhenries (IRC part #CL-1)

* Parallel with 3.3KΩ resistor
** Use adaptor plate
† Drill mounting hole.
▲ Parallel with 22KΩ resistor

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T	1/4A 250VAC	73600		318.250		GJV-1/4	

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M2	Pilot Light	11765	Type #51
M3A	RF Tuner	KRK12	Models 21-D-305U, 21-D-317U, 21-D-326U, 21-D-327U, 21-D-328U, 21-D-329U, 21-D-330U
B	RF Tuner	KRK11-B	Models 21-D-305, 21-D-317, 21-D-326, 21-D-327, 21-D-328, 21-D-329, 21-D-330
M4	Crystal Diode	77489	UHF Mixer (1N82)
M5	Crystal Diode	CR101	Video Detector
M6	Switch	77656	Function Selector
M7	Focus Magnet	76168	
M8	Ion Trap	76141	
A15	Trimmer Capacitor	71496	5-70MMF (IF Link)
B3,B6	Trimmer Capacitor	75217	10-160MMF, Horiz. Drive, Horiz. Locking Range
	Cabinet Back	77771	Models 21-D-305, 21-D-306U, 21-D-317, 21-D-317U
	Cabinet Back	77790	Models 21-D-326, 21-D-326U, 21-D-327, 21-D-327U
	Cabinet Back	77772	Models 21-D-328, 21-D-328U, 21-D-329 , 21-D-329U
	Cabinet Back	77773	Models 21-D-330, 21-D-330U
	Cover & Case Assy.	77774	Hidden controls, Mahogany, Walnut or red cherry instrument
	Cover & Case Assy.	77775	Hidden controls, Oak Instrument
	Cover Assy.	77761	Channel markers, Maple or natural cherry instr. for Models 21-D-305U, 21-D-317U, 21-D-326U, 21-D-327U, 21-D-328U, 21-D-329U, & 21-D-330U
	Cover Assy.	77759	Channel markers, walnut, red cherry for Models 21-D-305U 21-D-317U, 21-D-326U, 21-D-372U, 21-D-328U, 21-D-329U & 21-D-330U
	Cover Assy.	77760	Channel markers for oak instr. for Models 21-D-3050, 21-D-317U, 21-D-326U, 21-D-327U, 21-D-328U, 21-D-329U, 21-D-330U
	Safety Glass	77745	
	Mask	77768	Mahogany, Walnut or Red cherry
	Mask	77769	Oak, Maple or Natural Cherry
	Knob (Outer)	77709	Brightness Control for Mah., walnut or red cherry instr.
	Knob (Outer)	77718	Brightness Control for oak instr.
	Knob (Outer)	77734	Brightness Control for maple or natural cherry instr.
	Knob	77699	Picture Control for mah., walnut or red cherry
	Knob	77719	Picture for oak instru.
	Knob	77738	Picture for maple or natural cherry instru.
	Knob	77735	Tone-Function Selector for mah., walnut or red cherry
	Knob	77736	Tone-Function Selector for oak instr.
	Knob	77737	Tone-Function Selector for maple or natural cherry
	Knob	77751	Channel Selector for Mahogany, walnut or red cherry For Models 21-D-305U, 21-D-317U, 21-D-326U, 21-D-327U, 21-D-329U, 21-D-330U
	Knob	77752	Channel Selector for oak instr. Models 21-D-305U, 21-D-317U 21-D-326U, 21-D-327U, 21-D-329U, 21-D-330U
	Knob	77753	Channel Selector for maple or natural cherry for all Models
	Knob (Inner)	77708	Channel Selector for Models 21-D-305, 21-D-317, 21-D-326, 21-D-327, 21-D-328, 21-D-329, 21-D-330
	Knob (Outer)	77707	Fine Tuning for mah., walnut or red cherry, Models 21-D-305, 21-D-317, 21-D-326, 21-D-327, 21-D-328, 21-D-329, 21-D-330
	Knob (Outer)	77717	Fine Tuning for oak instr. Models 21-D-305, 21-D-317, 21-D-326 21-D-327, 21-D-328, 21-D-329, 21-D-330
	Knob (Outer)	77733	Fine Tuning maple or natural cherry Models 21-D-305, 21-D-317, 21-D-326, 21-D-327, 21-D-328, 21-D-329, 21-D-330
	Knob	77750	Fine Tuning Models 21-D-305U, 21-D-317U, 21-D-326U, 21-D-327U, 21-D-328U, 21-D-329U, 21-D-330U
	Knob (Inner)	77710	Off/On Volume

TROUBLE SHOOTING AIDS (CONT.)

VIDEO

SOUND BARS

Check adjustment of A54 (sound take off) in video amplifier grid circuit. Check local oscillator adjustment video IF alignment.

POOR RESOLUTION

Check by substitution video IF tubes. Check alignment of video IF stages.

SMEAR

Check video amplifier V9 and associated components, particularly the peaking coils.

ONE WIDE BLACK BAR

Check tuner, video IF, video delector and video amplifier tubes for filament to cathode leakage.

POOR CONTRAST

Check waveform W1;

If Unsatisfactory	If Satisfactory
Check V5, V6, V7 and V8. Check alignment.	Check waveform W2.

Check waveform W2;

If Unsatisfactory	If Satisfactory
Substitute V9 and check associated components.	Check picture tube and grid circuit components.

AUDIO

WEAK OR NO SOUND

Substitute V11, V12, V13, V14 and V15. Check associated components. Check speaker. Check sound IF and ratio detector alignment. Check function switch contacts.

BUZZ

Adjust ratio detector secondary for minimum buzz. If still noticable, substitute V13 and readjust.

DISTORTED

Check audio amplifier stages V14 and V15 using audio signal generator and scope;

If Undistorted	If Distorted
Substitute V11, V12 and V13. Check adjustment of ratio detector.	Check components of stage where distortion occurs.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21, V22 and V23. Check fuse in high voltage cage.
Check waveform W15;

If Unsatisfactory	If Satisfactory
Check horizontal oscillator components and coupling network between V19 and V20.	Check components of V21 and V22. Check T3 and T5. Check all associated components.

WEAK HIGH VOLTAGE

Follow procedure outlined under loss of high voltage.

BLOOMING

Substitute V20, V23, V24 and V25. Check associated components. Check picture tube.

LOSS OF FOCUS

Check C101 for open. Follow procedure outlined under blooming.

POWER

DIM PICTURE

Measure B plus;

If Low	If Normal
Substitute V24 and V25. Check for shorts.	Check V21, V22 and Boost B plus circuit.

SMALL RASTER, WEAK SOUND

Check B plus circuits for shorts. If no shorts are present and B plus is low, check V24 and V25.

GENERAL

RASTER, BUT NO PICTURE, SOUND OR SNOW

Check by substitution V2, V3, V5, V6 and V7. Check associated components.

WEAK PICTURE AND WEAK SOUND.

Substitute V3 and check components

SOUND BUT NO PICTURE

Check by substitution V9 and V10. Check associated components.

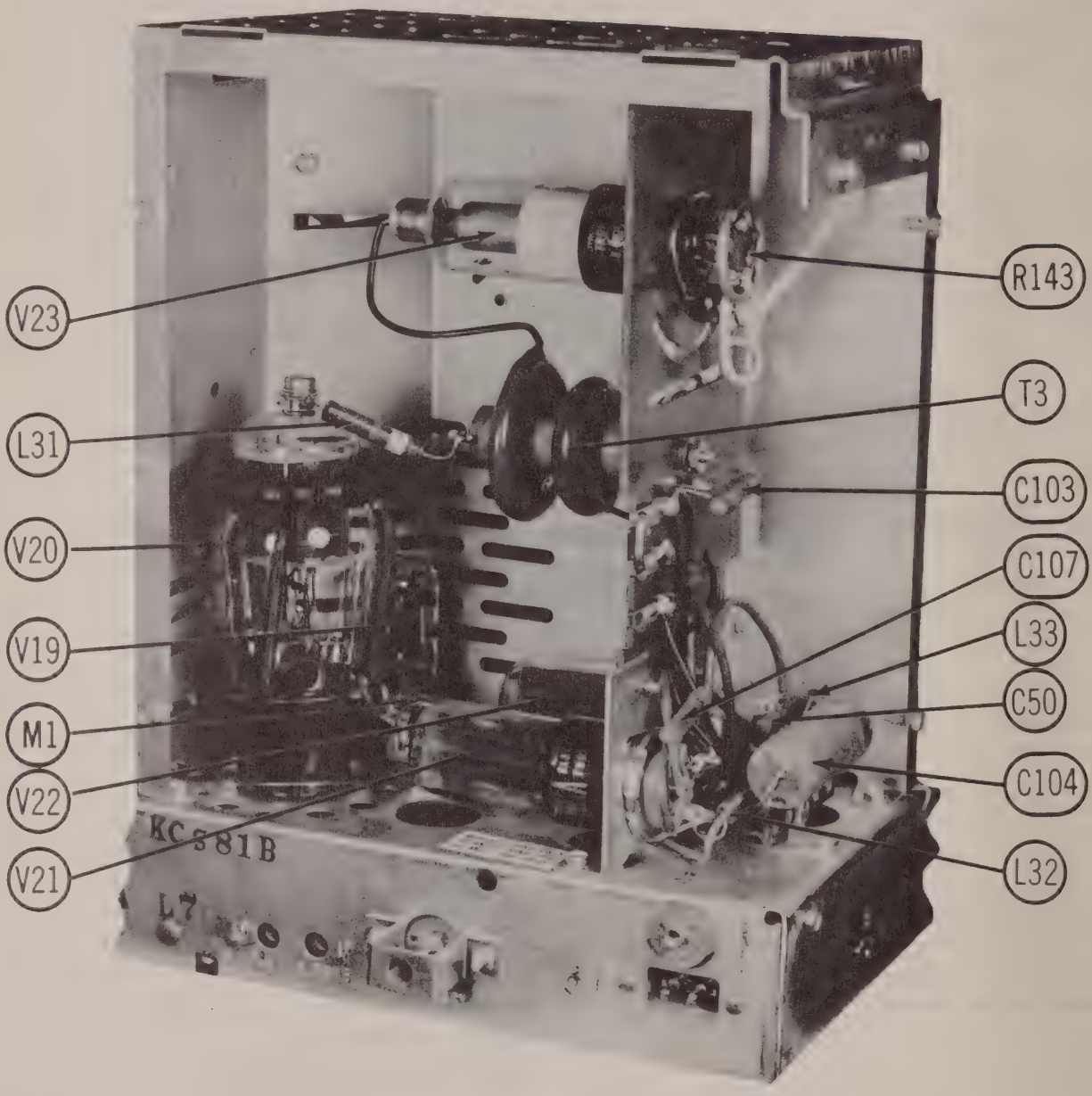
SNOWY PICTURE, GOOD SOUND

Substitute V1 and check components.

INTERMITTANT STREAKS

Check high voltage circuit for corona discharge and arcing. This may best be done by looking for a blue glow in the dark.

The Trouble-Shooting photographs shown above are made with permission of transmitting station WFBM-TV and in no way reflect the quality of the transmitted picture. Similarly, symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.



HIGH VOLTAGE COMPARTMENT

ALTERNATE TUNER SCHEMATIC

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner oscillator circuit, it is necessary to remove rear cover and supply power to set. Adjustments are located on top of tuner chassis. (Caution : Do not touch metal picture tube).

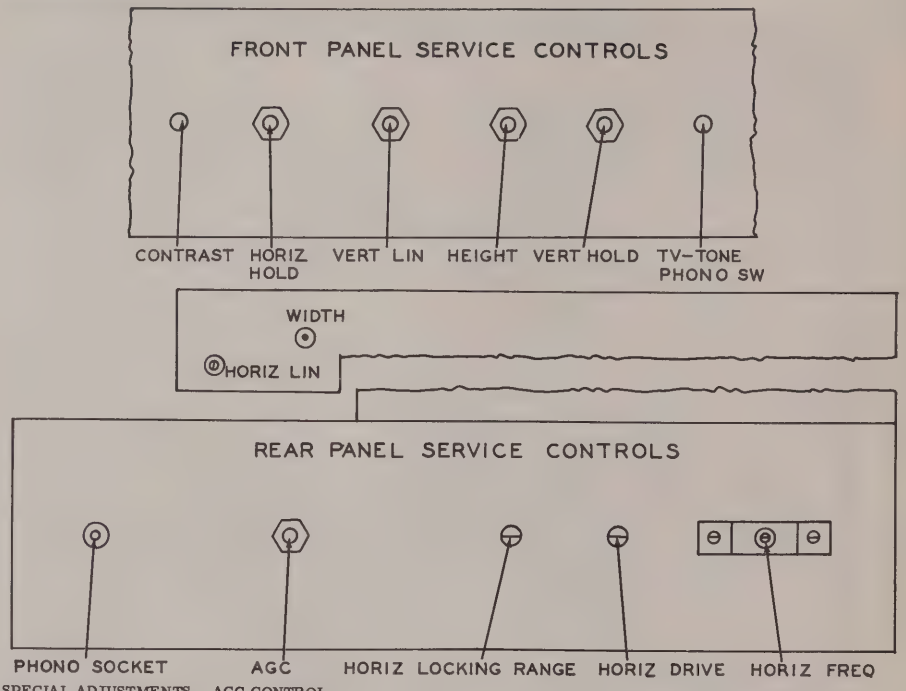
PICTURE TUBE SAFETY GLASS CLEANING

Remove 8 retainers from inside front of cabinet . Hold safety glass while removing metal frame. Remove safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See Disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - AGC CONTROL

Turn the AGC control fully counter clockwise, then clockwise until a very slight bend or change of bend in picture is noted. Then turn counter clockwise enough to remove the bend or change of bend.

With very weak signals turn AGC control clockwise until snow in picture becomes more pronounced then counter clockwise until best signal to noise ratio is obtained. Adjustment should be made on a strong signal if possible.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horiz. oscillator circuit can be made from the rear panel of the chassis. Set the horiz. hold control at the mid-position of its range and adjust the horizontal frequency slug until the picture synchronizes horizontally.

If synchronization cannot be obtained by the above adjustment see HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS on page 13.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L29) located on bottom of chassis. (See tube placement chart).

FUSES

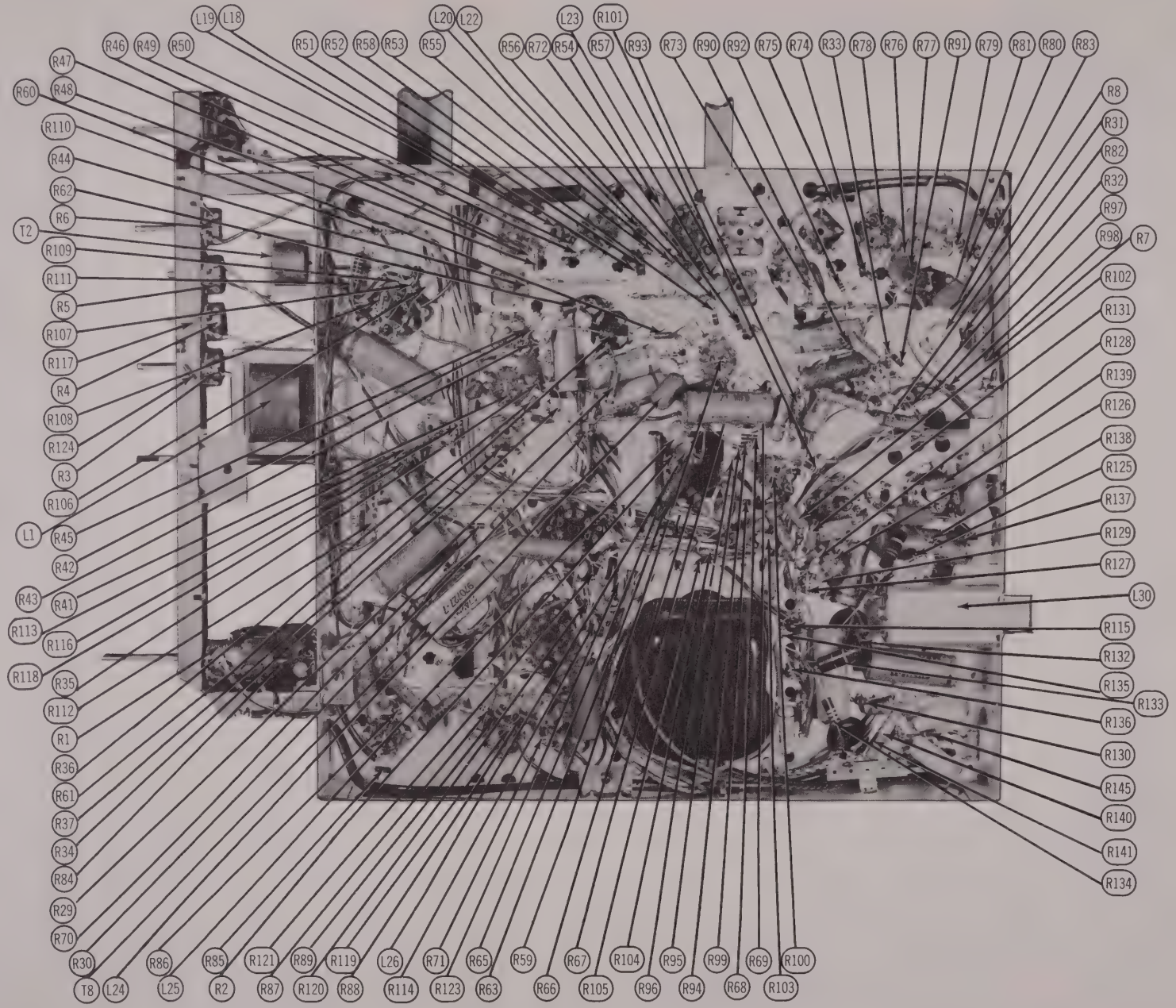
One fuse is used for Horizontal Sweep Circuit protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

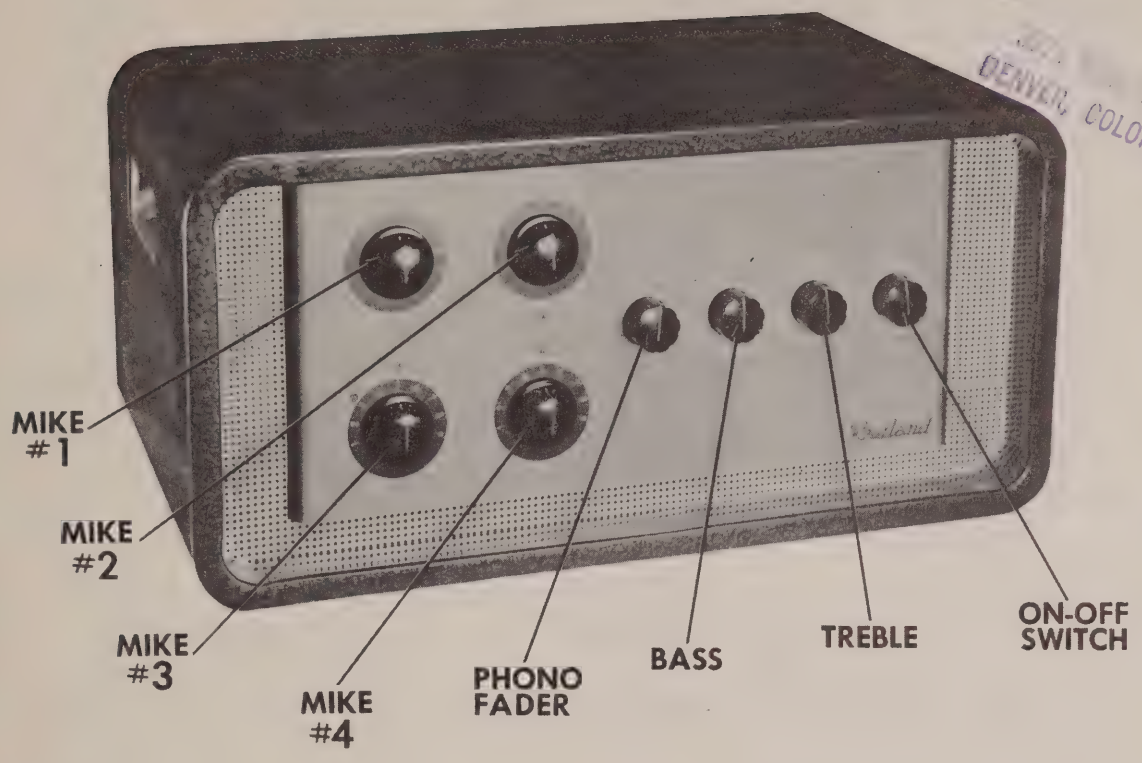
1. Remove 7 push on type control knobs from front panel.
2. Remove 2 wood and 2 metal screws. Remove rear cover.
3. Disconnect built-in antenna, transmission line, yoke plug, CRT socket, HV lead and speaker leads.
4. Remove 8 chassis bolts. Remove chassis.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

DENVER, COLORADO

RAULAND
MODEL 1960



RAULAND
MODEL 1960

TRADE NAME	Rauland Model 1960
MANUFACTURER	Rauland -Borg Corp., 3523 W. Addison, Chicago 18, Ill.
TYPE SET	AC Operated 6 Channel 60 Watt Audio Amplifier
TUBES	Fifteen
POWER SUPPLY	110-125 Volts AC-60 Cycle RATING 1.4 Amp. @ 117 Volts AC

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		RAULAND PART No.	STANDARD REPLACEMENT		
V1	Mic Pre Amp.	6SQ7	6SQ7	8Q	
V2	Mic Pre Amp.	6SQ7	6SQ7	8Q	
V3	Mic Pre Amp.	6SQ7	6SQ7	8Q	
V4	Mic Pre Amp.	6SQ7	6SQ7	8Q	
V5	Phono Pre Amp.	6SQ7	6SQ7	8Q	
V6	Mixer	6SC7	6SC7	8S	
V7	Mixer	6SC7	6SC7	8S	
V8	Phase Inverter	6SN7GTA	6SN7GTA	8BD	
V9	Driver	6SN7GTA	6SN7GTA	8BD	
V10	Audio Output	6L6	6L6	7S	
V11	Audio Output	6L6	6L6	7S	
V12	HV Rectifier	5U4G	5U4G	5T	
V13	HV Rectifier	5U4G	5U4G	5T	
V14	LV Rectifier	5Y3GT	5Y3GT	5T	
V15	LV Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

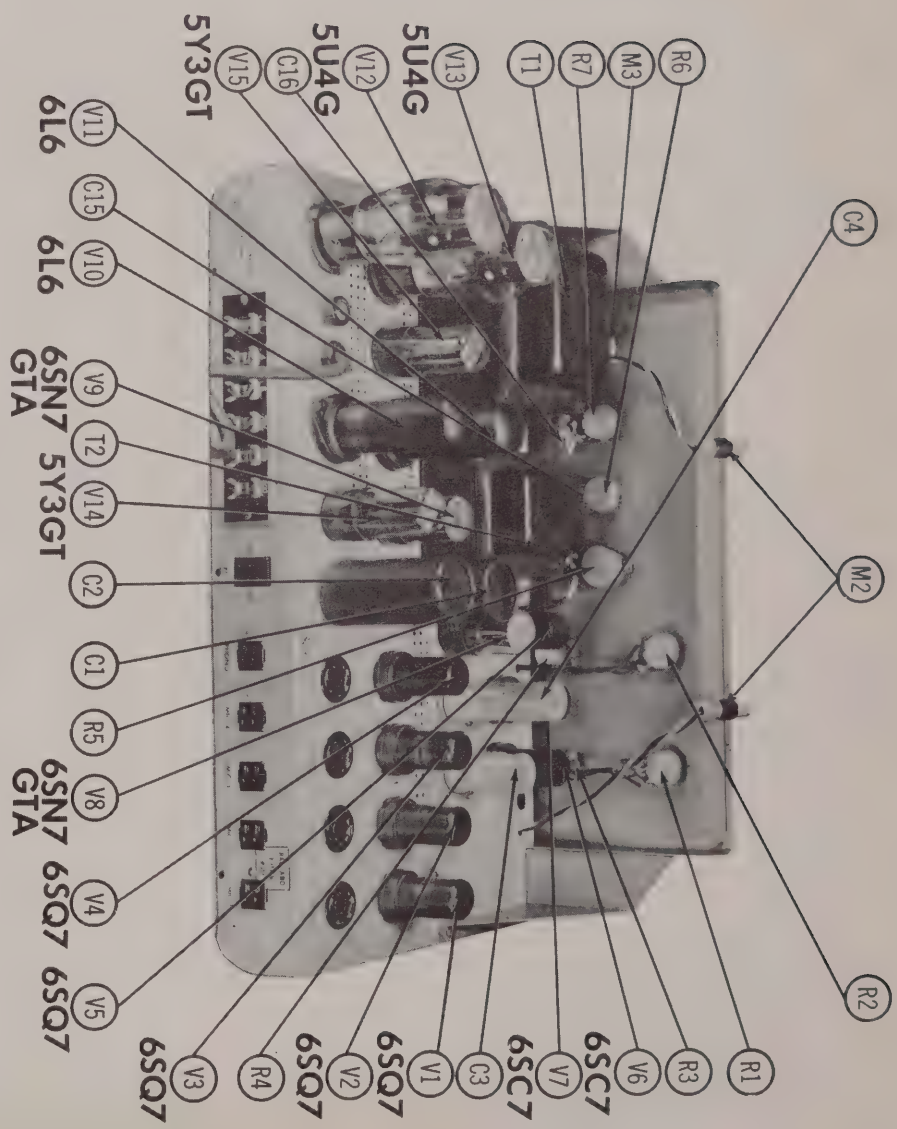
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RAULAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	125	350	CE-127	AFH1-43		A041		FP140	TVL-1638	
C2	125	350	CE-127	AFH1-43		A041		FP140	TVL-1638	
C3	150	50		AFH1-24		A015		FP117	TVL-1320	Note 1
C4A	▲10	450	CE-306A	AFH3-31		C024		FP375.8	TVL-3776	
B	■10	450								
C	10	450								
C5	8	450	CE-805B	PRS450/8		BR845A		TC71	TVA-1704	
C6A	40	25		PRS150/40-40		EDL4415		TCD48	TVA-2445	
B	40	25								
C7A	40	25		PRS150/40-40		EDL4415		2N511	TVA-2445	
B	40	25								
C8	40	25		PRS25/50		BR502A		TC29	TVA-1206	
C9	40	25		PRS25/50		BR502A		TC29	TVA-1206	
C10	.022	600		P688-022	DD-203	PTE6S22		PT6122	6TM-S22	
C11	.022	600		P688-022	DD-203	PTE6S22		PT6122	6TM-S22	
C12	.022	600		P688-022	DD-203	PTE6S22		PT6122	6TM-S22	
C13	.022	600		P688-022	DD-203	PTE6S22		PT6122	6TM-S22	
C14	.047	600		P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C15	.001	600		P688-001	D6-102	PTE6D1	801-001	PT621	6TM-D1	
C16	.022	600		P688-022	DD-203	PTE6S22		PT6122	6TM-S22	
C17	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C18	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C19	500	500		1468-0005	D6-501	5W5T5	GP2K-501	MC245	1FM-35	
C20	.01	1600		P1688-01	D16-103	PTE16S1		PT1611	MB-S1	
C21	.01	1600		P1688-01	D16-103	PTE16S1		PT1611	MB-S1	
C22	.05	600		689ZX-05		TVC6S5		OT106	PX-156	

Note 1. Some Models use 250MFD in this application (Part #CE-257A).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RAULAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	RP-504B-D	Q13-133	AG-60-Z	BSK-60	U-48	Mike #1 Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	RP-504B-D	Q13-133	AG-60-Z	BSK-60	U-48	Mike #2 Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	RP-504B-D	Q13-133	AG-60-Z	BSK-60	U-48	Mike #3 Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R3A
R4A	500KΩ	½	RP-504B-D	Q13-133	AG-60-Z	BSK-60	U-48	Mike #4 Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R4A
R5	1Meg	½	RP-105A-F	QVC-539X		MT-144		Phono Volume- Tap@ 500KΩ
R6A	2Meg	½	RP-205B-E	Q17-139		AB-77		Bass
B	Shaft		Not Req.	Not Req.		AK-4		Attach to R6A
R7A	100KΩ	½	RP-104A-D	Q13-128	AG-51-Z	AB-41	U-39	Treble
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R7A
R8A	100Ω	2	RPW-101B	W-100	A43-100	VK-121	R100L	Hum Balance-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R8A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RAULAND PART No.	IRC PART No.	
R9	2.2Meg	½		BTS-2.2Meg	
R10	3300Ω	½		BTS-3300	
R11	220KΩ	½		BTS-220K	
R12	470KΩ	½		BTS-470K	
R13	2.2Meg	½		BTS-2.2Meg	
R14	3300Ω	½		BTS-3300	
R15	220KΩ	½		BTS-220K	
R16	470KΩ	½		BTS-470K	
R17	2.2Meg	½		BTS-2.2Meg	
R18	3300Ω	½		BTS-3300	
R19	220KΩ	½		BTS-220K	
R20	470KΩ	½		BTS-470K	
R21	2.2Meg	½		BTS-2.2Meg	
R22	3300Ω	½		BTS-3300	
R23	220KΩ	½		BTS-220K	
R24	4700Ω	½		BTS-4700	
R25	100KΩ	½		BTS-100K	
R26	330Ω	½		BTS-330	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RAULAND PART No.	IRC PART No.	
R27	47KΩ	1		BTA-47K	
R28	33KΩ	½		BTS-33K	
R29	1000Ω	½		BTS-1000	
R30	68Ω	½			
R31	1500Ω	½		BTS-1500	
R32	100KΩ	½		BTS-100K	
R33	1500Ω	½		BTS-1500	
R34	100KΩ	½		BTS-100K	
R35	6800Ω	½		BTS-6800	
R36	4700Ω	1		BTA-4700	
R37	4700Ω	1		BTA-4700	
R38	100KΩ	½		BTS-100K	
R39	1000Ω	½		BTS-1000	
R40	100KΩ	2		BTB-100K	
R41	470Ω	2		BTB-470	
R42	750Ω	10		1 3/4A-750	
R43	1000Ω	10		1 3/4A-1000	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	RAULAND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	130V tap @ 117V @1.4A	740VCT tap @ 456VCT total .123ADC	144 VCT .027ADC	5VAC @ 6A	LP-0214				
		SEC. 4	SEC.5	SEC.6					
		5VAC @ 2A	5VAC @ 2A	6.3VAC @ 5.2A					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		RAULAND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	3.2KΩ	500Ω tap @ 250Ω, 70V, 8Ω, 4Ω	110Ω CT	31.2Ω tap @ 17Ω, 3.56Ω, .59Ω, .47Ω	LO-0123					

TRANSFORMER (DRIVER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	RAULAND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T3	930Ω CT .045ADC	192Ω CT			LD-0014				

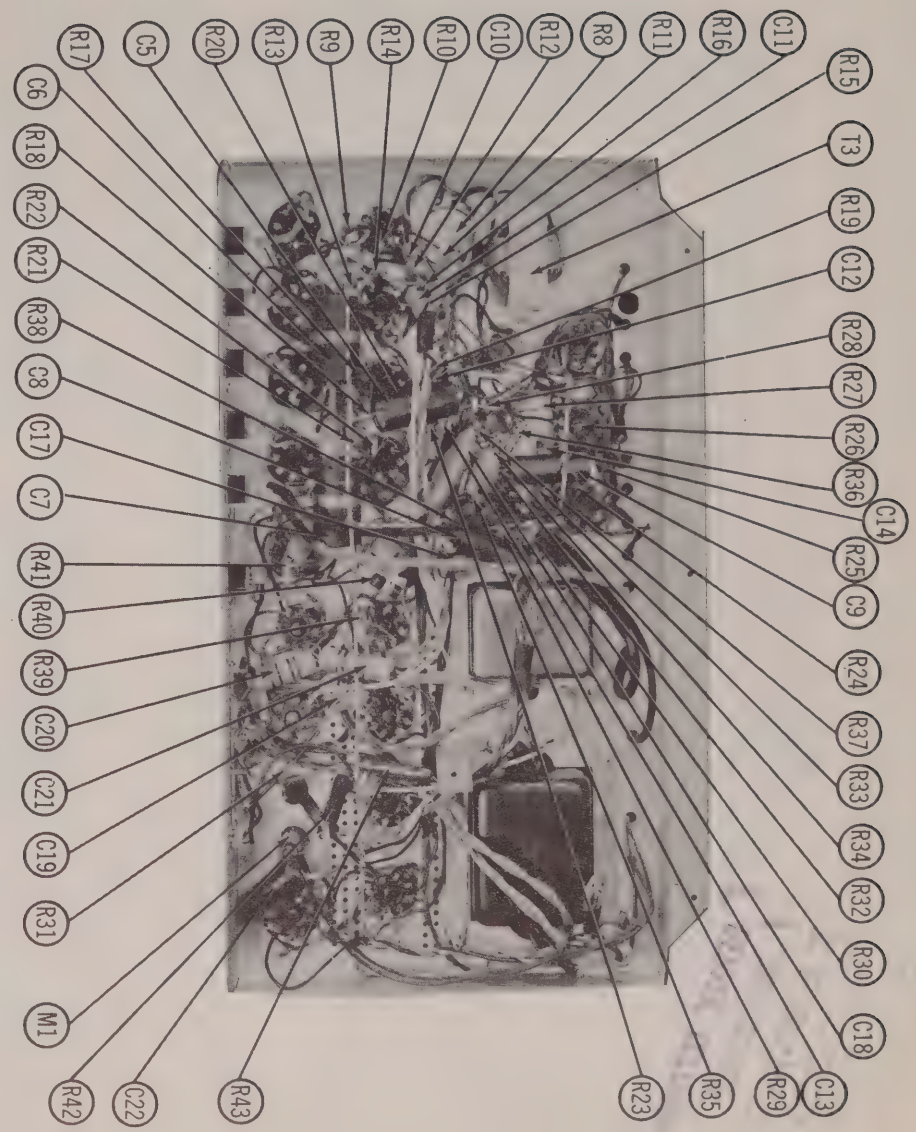
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RAULAND PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG (Slo-Blo)	5A @125V			313005. (3AG 5A Slo-Blo)	341001	MDL-5	HKP

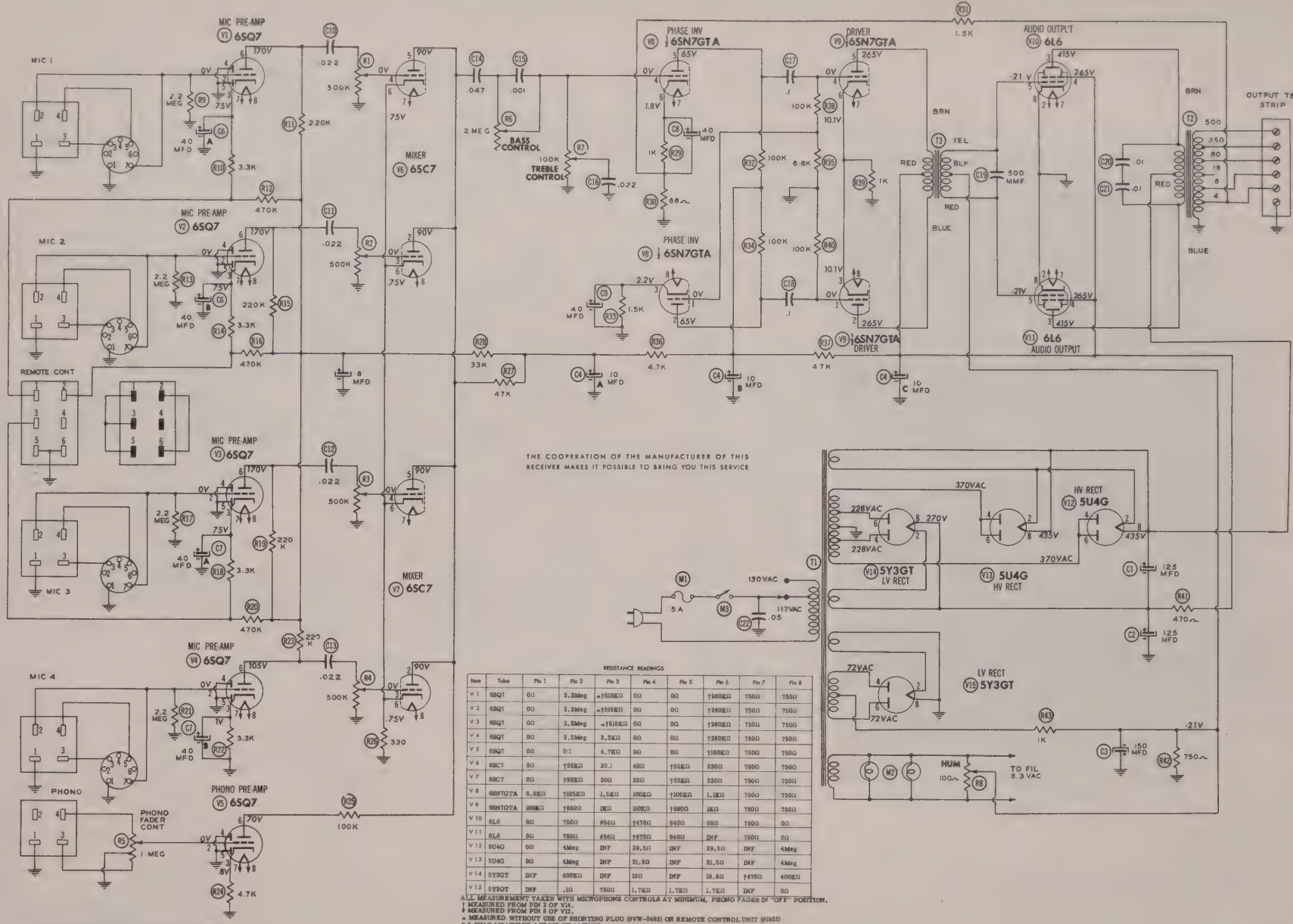
MISCELLANEOUS

ITEM No.	PART NAME	RAULAND PART No.	NOTES
M2	Pilot Light		Type #44 (2 used)
M3	Switch		Off/On (SPST Rotary)

CHASSIS—BOTTOM VIEW



RAULAND MODEL 1960



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SQ7	0Ω	2.2Meg	▲†815KΩ	0Ω	0Ω	†260KΩ	750Ω	750Ω
V 2	6SQ7	0Ω	2.2Meg	▲†515KΩ	0Ω	0Ω	†260KΩ	750Ω	750Ω
V 3	6SQ7	0Ω	2.2Meg	▲†515KΩ	0Ω	0Ω	†260KΩ	750Ω	750Ω
V 4	6SQ7	0Ω	2.2Meg	3.3KΩ	0Ω	0Ω	†260KΩ	750Ω	750Ω
V 5	6SQ7	0Ω	0Ω	4.7KΩ	0Ω	0Ω	†260KΩ	750Ω	750Ω
V 6	6SC7	0Ω	†55KΩ	20Ω	40Ω	†55KΩ	330Ω	750Ω	750Ω
V 7	6SC7	0Ω	†55KΩ	30Ω	25Ω	†55KΩ	330Ω	750Ω	750Ω
V 8	6SN7GTA	6.8KΩ	†105KΩ	1.5KΩ	100KΩ	†105KΩ	1.1KΩ	750Ω	750Ω
V 9	6SN7GTA	100KΩ	†880Ω	1KΩ	100KΩ	†880Ω	1KΩ	750Ω	750Ω
V 10	6L6	0Ω	750Ω	#64Ω	†470Ω	840Ω	68Ω	750Ω	0Ω
V 11	6L6	0Ω	750Ω	#56Ω	†470Ω	840Ω	INF	750Ω	0Ω
V 12	5U4G	0Ω	4Meg	INF	29.5Ω	INF	29.5Ω	INF	4Meg
V 13	5U4G	0Ω	4Meg	INF	31.5Ω	INF	31.5Ω	INF	4Meg
V 14	5Y3GT	INF	400KΩ	INF	18Ω	INF	18.8Ω	†470Ω	400KΩ
V 15	5Y3GT	INF	.1Ω	750Ω	1.7KΩ	1.7KΩ	1.7KΩ	INF	0Ω

ALL MEASUREMENT TAKEN WITH MICROPHONE CONTROLS AT MINIMUM, PHONO FADER IN "OFF" POSITION.
† MEASURED FROM PIN 2 OF V14.
▲ MEASURED FROM PIN 8 OF V12.
● MEASURED WITHOUT USE OF SHORTING PLUG (#VW-0483) OR REMOTE CONTROL UNIT (#1933)
* 6.3VAC MEASURED ACROSS FILAMENTS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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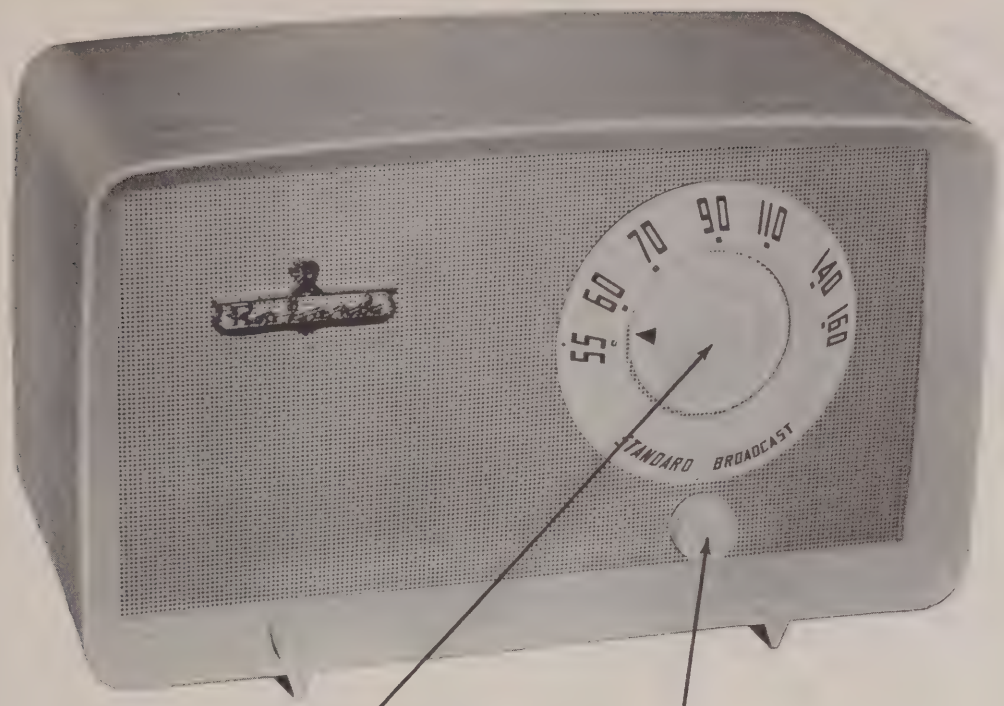
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 Volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

ROLAND
MODEL 5T1V



TUNING CONTROL

ON-OFF SWITCH
VOLUME CONTROL

ROLAND
MODEL 5T1V

TRADE NAME	Roland Model 5T1V
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC/DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC/DC — RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1650KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of of receiver. Adjust for maximum output.
4.		"	600KC	Tune to 600KC	"		Check tracking. If necessary bend outer rotor plates of antenna section of tuning gang for optimum tracking, then repeat step 3.

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

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PARTS LIST AND DESCRIPTIONS

ROLAND
MODEL 5T1V

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		ROLAND PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150		PRS150/50-30		EDL5315		2N520	TVA-2450	
B	30	150								
C2	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3	47			SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C4	220	500		1468-00025	D6-221	5W5T25	GP2K-221		1FM-325	
C5A	220									
B	.002									
C	.005				♦PC-150		♦1408-01		♦103C4	
D	250									
E										
C6	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C7	.01	600		P688-01		PTE6S1		PT611	6TM-S1	
C8	.1	400		P488-1		PTE4P1		PT401	4TM-P1	

♦ Items C5A, C5B, C5C, C5D, C5E, R5A, R5B, R5C are combined in one unit.
When replacing items separately C5D and C5E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	VC-51	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R2	10KΩ	½		BTS-10K	
R3	150Ω	½		BTS-150	
R4	2.2Meg	½		BTS-2.2Meg	
R5A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½	♦	BTS-470K	
C	470KΩ	½		BTS-470K	

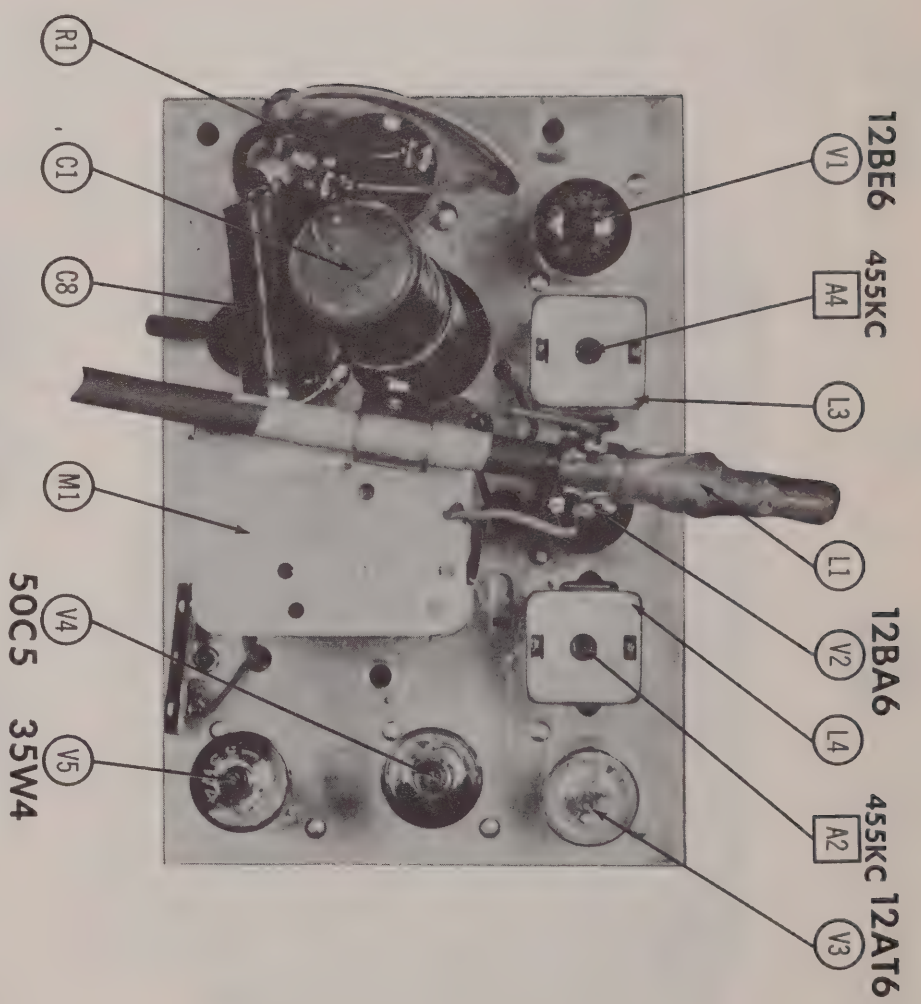
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R6	150Ω	1		BTA-150	
R7	18Ω	½			
R8	2200Ω	1		BTA-2200	

♦ Items R5A, B, C, C5A, B, C, D and E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ROLAND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.6KΩ	3.4Ω	150Ω	.54Ω		A-3332 ①	A-3025 ①	RO-302 ①	S-1X ①	① Bend mounting tabs down, file out slots, mount on orig. mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.4Ω		ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

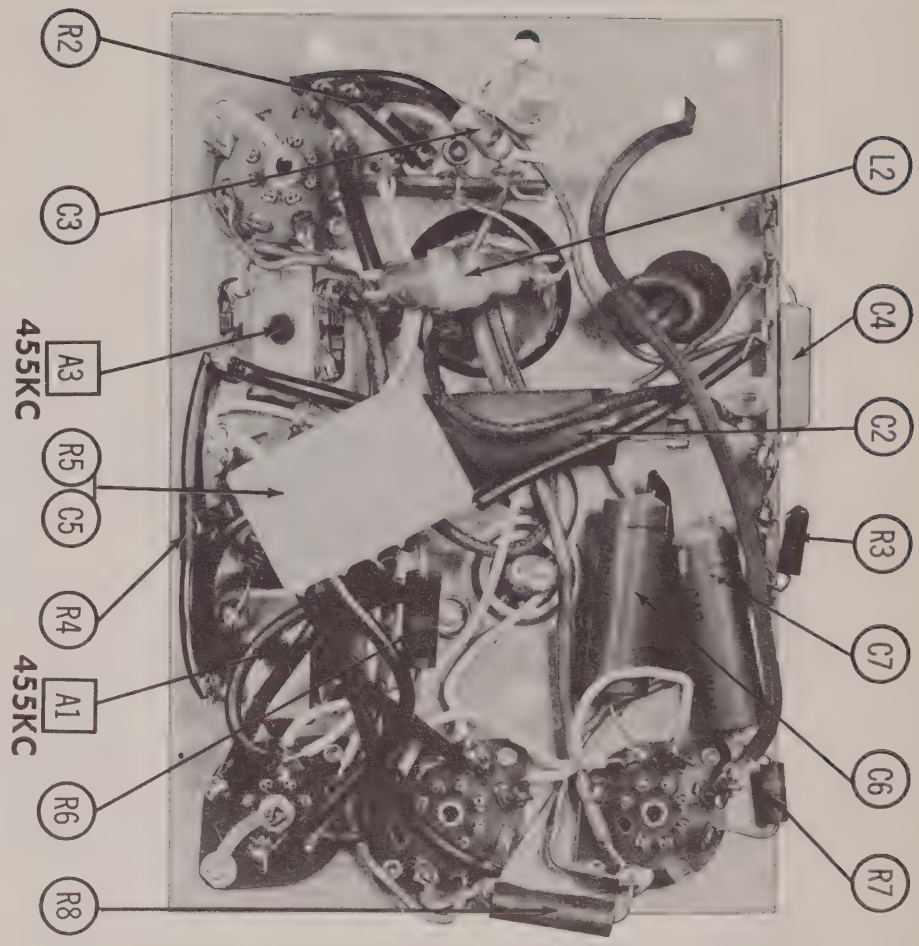
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ROLAND PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	.8Ω		LPFE-11A				
L2	Osc.Coil	.6Ω	3.3Ω		14-1074		70-Osc.*	
L3	Input IF	22Ω	21Ω	LF-50	16-6758	BC-352	12-C1	
L4	Output IF	22Ω	21Ω	LF-50	16-6758	BC-353	12-C2	

* Disregard tap on secondary winding.

MISCELLANEOUS

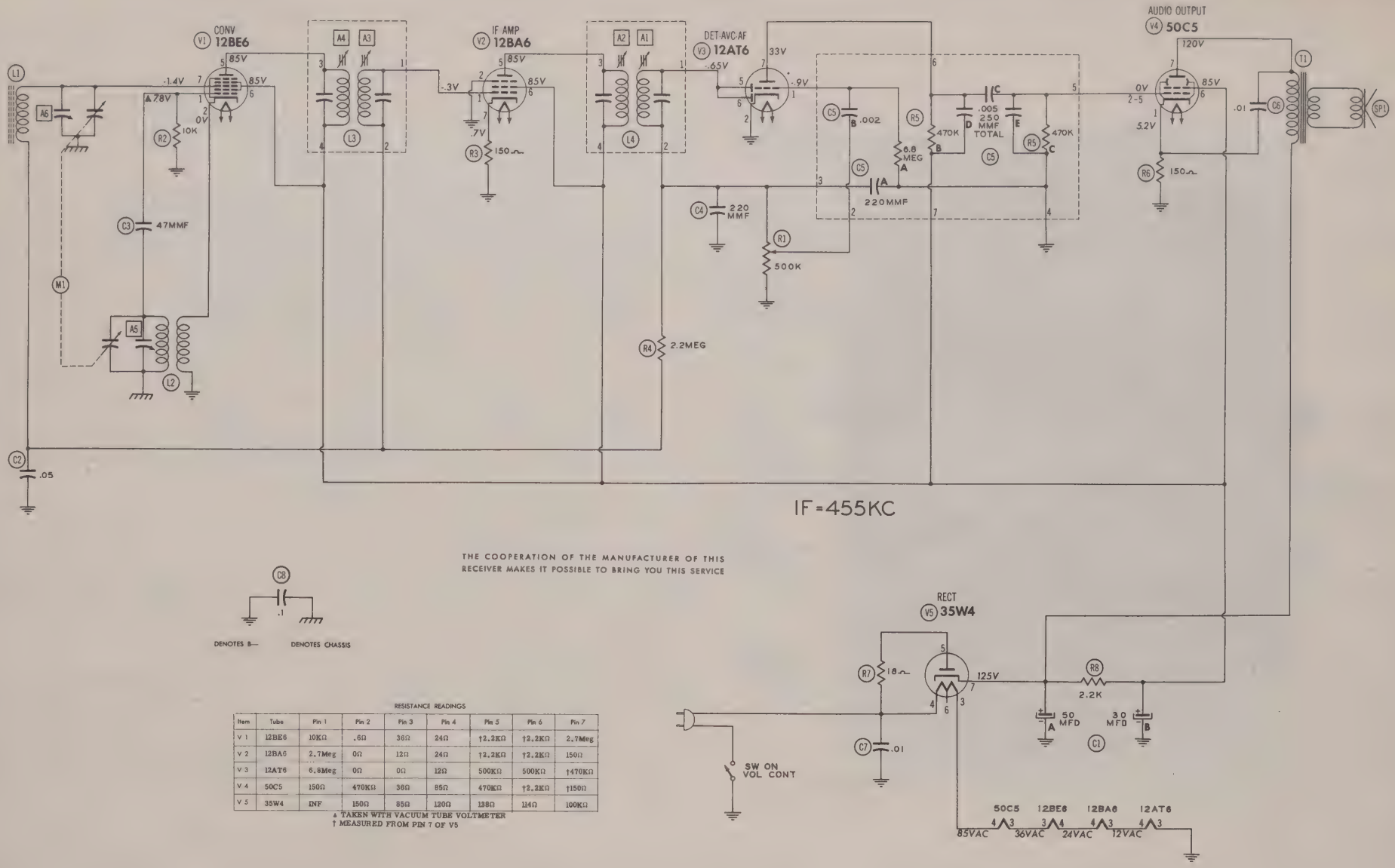
ITEM No.	PART NAME	ROLAND PART No.	NOTES
M1	Tuning Capacitor	CV20A	29-457MMF, 32-190MMF

CHASSIS—BOTTOM VIEW



ROLAND MODEL 5T1V

ROLAND MODEL 5T1V



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	10KΩ	.6Ω	36Ω	24Ω	†2.2KΩ	†2.2KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	12Ω	24Ω	†2.2KΩ	†2.2KΩ	150Ω
V 3	12AT6	6.8Meg	0Ω	0Ω	12Ω	500KΩ	500KΩ	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	85Ω	470KΩ	†2.2KΩ	†150Ω
V 5	35W4	INF	150Ω	85Ω	120Ω	138Ω	114Ω	100KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V5

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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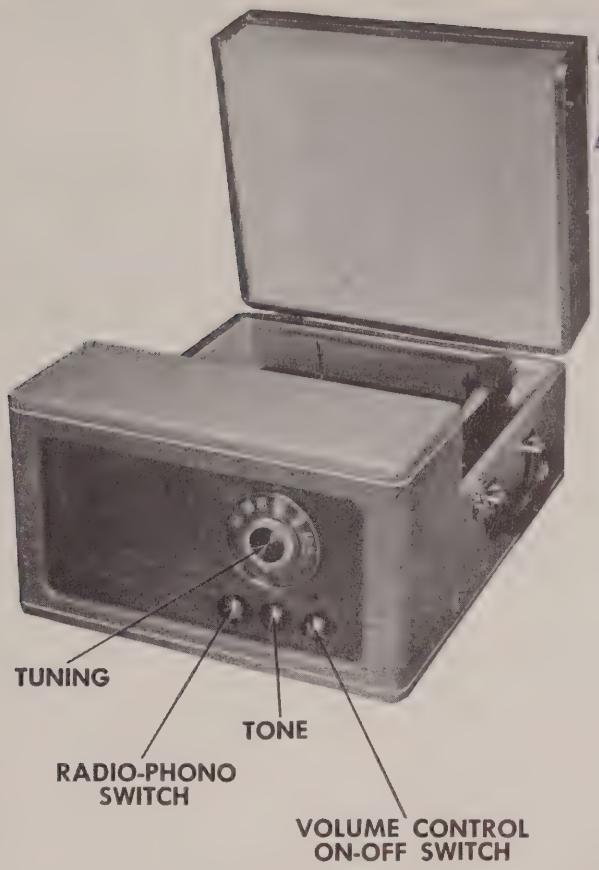
208-10

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

SILVERTONE MODEL
2041 (Ch. 528.235)

PROPERTY OF
L. E. [illegible]
DENTAL CORONADO



TRADE NAME	Silvertone Model 2041 (Ch. 528.235)
SUPPLIER	Sears Roebuck & Co., 925 So. Homan Ave., Chicago, Ill.
TYPE SET	AC Operated Radio-Phono Combination AM Superheterodyne Receiver
TUBES (Five)	Types 12SA7GT Conv., 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF Amp., 50L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .22 Amp. @ 117 Volts Ac
TUNING RANGE--BROADCAST	535-1630 KC

ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 8 (grid) of 12SA7 (V1). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1630KC	"	"	A5	Adjust for maximum output. Adjust trimmer at opposite end of stator plates only if range of A5 is insufficient.
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

To set pointer turn tuning gang fully closed and set "55" on dial approximately 1/8" to left of index dot on front of cabinet.

RECORD CHANGER UNIT- V-M MODEL 940

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12SA7GT	12SA7GT	8R	
V2	IF Amplifier	12SK7GT	12SK7GT	8N	
V3	Det-AVC-AF Amp.	12SQ7GT	12SQ7GT	8Q	
V4	Audio Output	50L6GT	50L6GT	7S	
V5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	T18-304	PRS150/50-		EDL5315		2N520	TVA-2450	Red
B	30	150		30						Yellow
C2	.05	200	T16-197	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	47		T15-229							
C4A	220		♦T17-104	SI220	D6-221	TM5T2	GP2K-221	UC-5322	♦34C3	
B	.002			BPD-002	D6-202	TM5D2	801-002	DC-522		
C	220			SI220	D6-221	TM5T2	GP2K-221	UC-5322		
D	.005			BPD-005	MD-502	TM5D5	811-005	DC-525		
C5	.02	400	T16-150	P488-02	DD-203	PTE4S2		PT412	4TM-S2	
C6	.05	400	T16-189	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C7	.005	600	T16-190	P688-005	MD-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C8	.005	600	T16-190	P688-005	MD-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C9	.05	400	T16-189	489ZX-05		PJ4S5		PT415	4TM-S5	
C10	.05	400	T16-189	P488-05	DF-503	PTE4S5		PT415	4TM-S5	

♦ Items C4A, C4B, C4C, C4D, are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	T24-196	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	1 Meg	½	T26-128	Q11-137	AG-61-S	AB-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A

RESISTORS

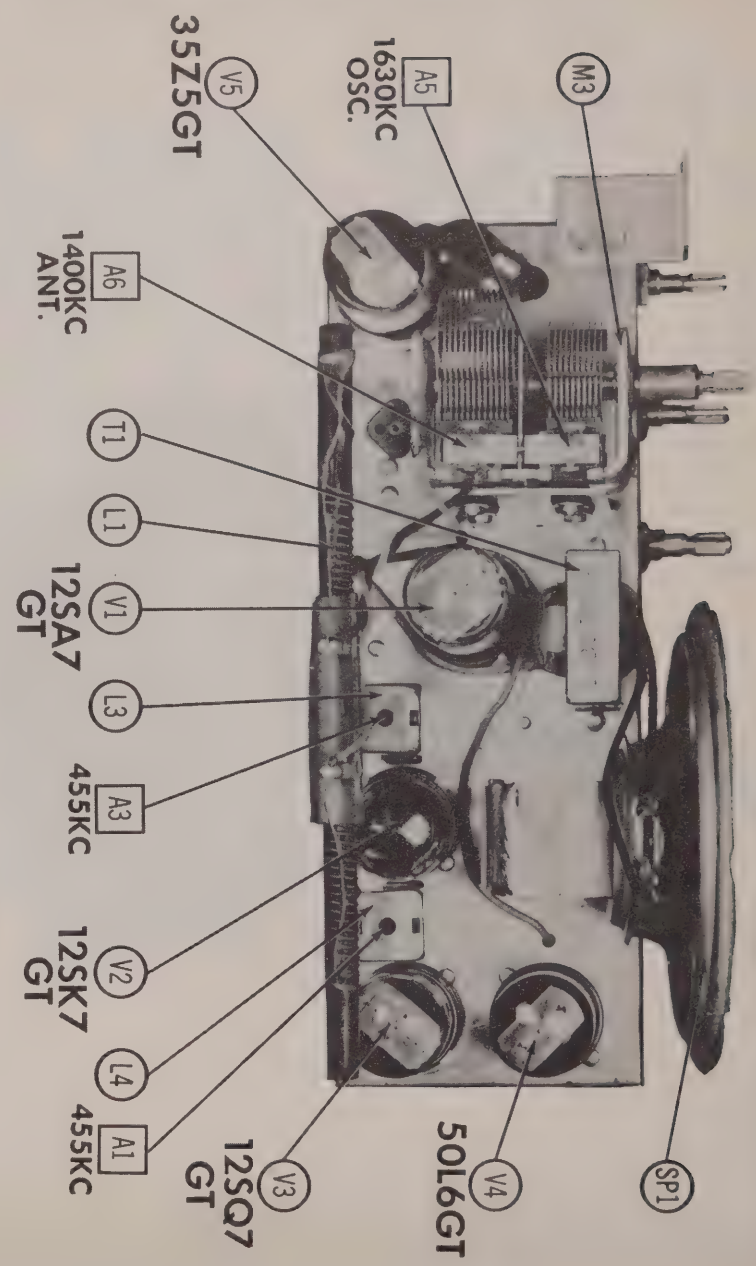
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R3	22KΩ	½	T60-659	BTS-22K	
R4	2.2Meg	½	T60-726	BTS-2.2Meg	
R5	47KΩ	½	T60-730	BTS-47K	
R6	470KΩ	½	T60-731	BTS-470K	
R7	10Meg	½	T60-728	BTS-10Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R8	220KΩ	½	T60-667	BTS-220K	
R9	470KΩ	½	T60-731	BTS-470K	
R10	180Ω	½	T60-774	BTS-180	
R11	1000Ω	1	T60-732	BTA-1000	
R12	27Ω	½	T60-690		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2.46KΩ	3.7Ω	227Ω Tap@ 12Ω	.75Ω	80-268	A-3330	A-3031	RO-3	S-1X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.7Ω	79-380	ST-105 Mod. P5-X	5A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	.4Ω		T82-72				
L2	Osc. Coil	1.7Ω	8Ω	T10-572			70-Osc. *	
L3	Input IF	20Ω	20Ω	T10-508	16-6758	BC-352	12-C1	
L4	Output IF	21Ω	21Ω	T10-479	16-6758	BC-353	12-C2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	Silvertone PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	K3797	GC-AG-J	G-AG	WC36B	A56U	43	0-2 or S-2	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

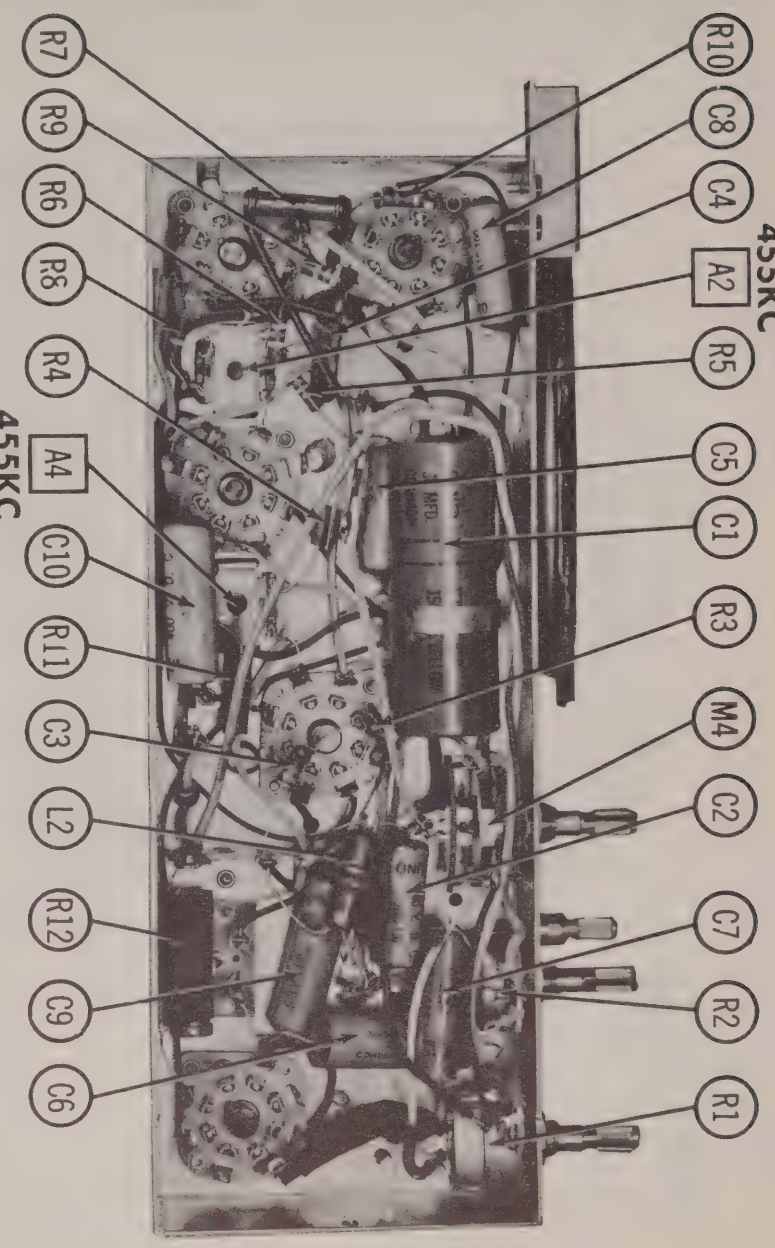
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Silvertone PART No.	WALCO PART No.	JENSEN PART No.	
M2		W-3AGS or W-3AGA	S-642 or S-652	

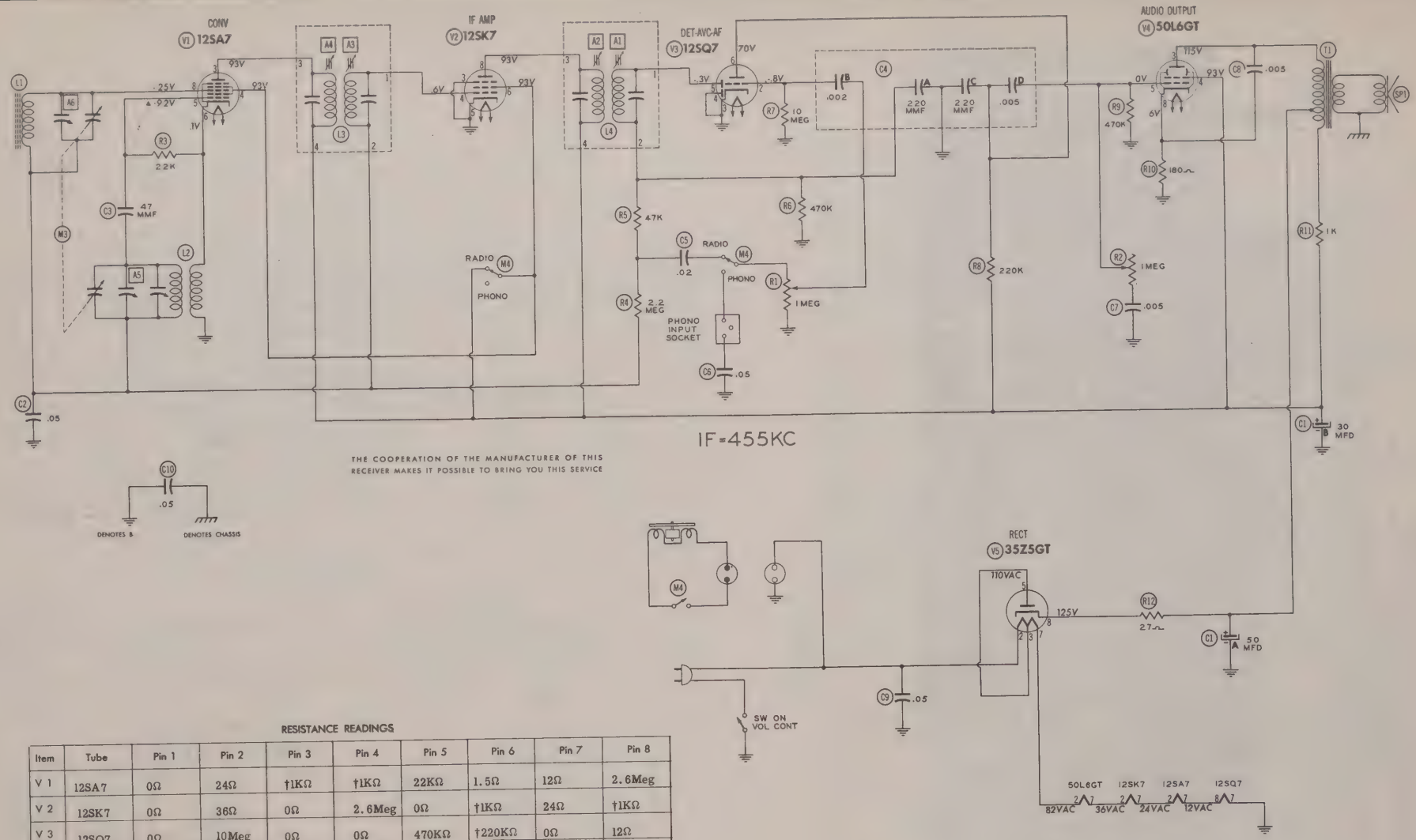
MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuning Capacitor	T19-222	38-472MMF, 31-200MMF
M4	Switch	T69-190	Radio-Phono Selector
	Cabinet	T42-528	
	Knob	T52-323	Off/On , Volume
	Knob	T52-327	Tone
	Knob	T52-328	Radio-Phono
	Knob	T52-380	Tuning
	Knob	T52-381	Dial

CHASSIS—BOTTOM VIEW



SILVERTONE MODEL 2041 (Ch. 528. 235)



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0Ω	24Ω	†1KΩ	†1KΩ	22KΩ	1.5Ω	12Ω	2.6Meg
V 2	12SK7	0Ω	36Ω	0Ω	2.6Meg	0Ω	†1KΩ	24Ω	†1KΩ
V 3	12SQ7	0Ω	10Meg	0Ω	0Ω	470KΩ	†220KΩ	0Ω	12Ω
V 4	50L6GT	INF	82Ω	†254Ω	†1KΩ	470KΩ	0Ω	36Ω	180Ω
V 5	35Z5GT	INF	117Ω	110Ω	INF	110Ω	INF	82Ω	60KΩ

ALL MEASUREMENTS IN RADIO POSITION
▲ TAKEN WITH A VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 8 OF V5

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DENVER, COLORADO

SILVERTONE MODEL
2225 (Ch. 528.233)

SILVERTONE MODEL
2225 (Ch. 528.233)

TRADE NAME	Silvertone Model 2225 (Ch. 528.233)
SUPPLIER	Sears Roebuck & Co., 925 So. Homan, Chicago, Ill.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Five)	Types 1U4 RF Amp., 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC/DC or 9 Volts "A" Supply & 90 Volts "B" Supply in Pack Form
RATING	.12 Amp. @ 117 Volts AC or 68MA @ 9 Volts DC & 15 MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1610 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V2). Low side to B-.	455KC (400~Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	High side to stator of antenna section of tuning gang.	1610KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal	"	A6	"
4.		Loop	"	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

To set pointer, turn tuning gang fully closed and set pointer perpendicular to base of cabinet.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Silvertone PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	1U4	1U4	6AR	
V2	Converter	1R5	1R5	7AT	
V3	IF Amplifier	1U4	1U4	6AR	
V4	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V5	Audio Detector	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▬50	150	T18-296	AFH4-33		DO86		FP409.4	R1055	
B	■30	150								
C	▲200	25								
C2	.05	200	T16-152	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	5000		T16-177	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C4	10	500	T15-186	1468-00001	D6-100	5W5Q1	GP1K-100	MC215	1FM-45	
C5	10000		T15-211	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C6	5000		T16-177	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C7	.05	200	T16-152	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C8	.05	200	T16-152	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C9A	150		T17-103	SI150	D6-151	TM5T15	GP2K-151	UC-5315	34C4	
B	.002			BPD-002	DD-202	TM5D2	801-002	DC-522		
C	100			SI100	D6-101	TM5T1	GP1K-101	UC-531		
D	.005			BPD-005	MD-502	TM5D5	811-005	DC-525		
E	.005			BPD-005	MD-502	TM5D5	811-005	DC-525		
C10	.002	600	T16-198	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C11	.05	400	T16-179	P488-05		PTE4S5		PT415	4TM-S5	
C12	.05	400	T16-179	P488-05		PTE4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Silvertone PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	T24-201	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	73-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

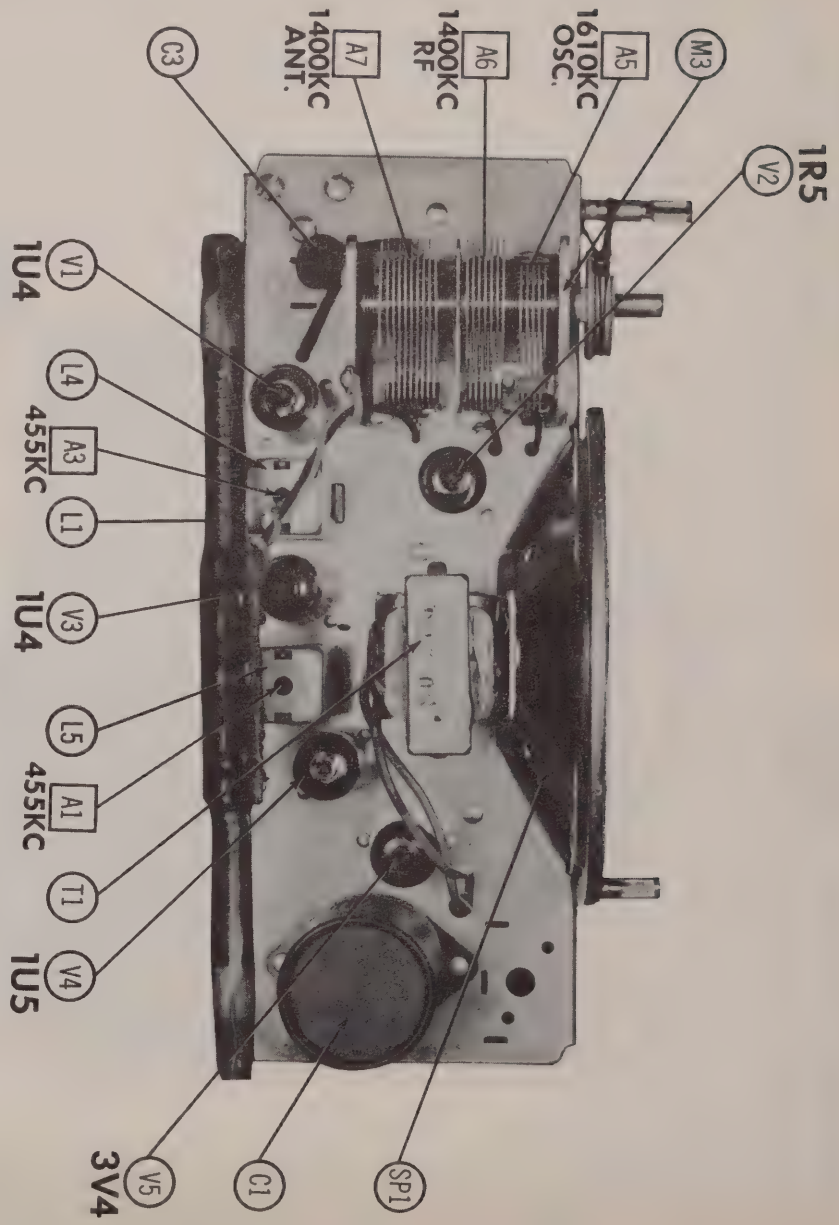
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Silvertone PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	4.7Meg	½	T60-779	BTS-4.7Meg	
R3	1500Ω	½	T60-729	BTS-1500	
R4	680Ω	½	T60-708	BTS-680	
R5	22KΩ	½	T60-744	BTS-22K	
R6	100KΩ	½	T60-727	BTS-100K	
R7	27KΩ	½	T60-745	BTS-27K	
R8	10Meg	½	T60-728	BTS-10Meg	
R9	470Ω	½	T60-770	BTS-470	
R10	2.2Meg	½	T60-726	BTS-2.2Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Silvertone PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R11	47KΩ	½	T60-730	BTS-47K	
R12	10Meg	½	T60-728	BTS-10Meg	
R13	4.7Meg	½	T60-779	BTS-4.7Meg	
R14	1Meg	½	T60-668	BTS-1Meg	
R15	820KΩ	½	T60-799	BTS-820K	
R16	330Ω	½	T60-704	BTS-330	
R17	110Ω	3	T60-796		
R18	1500Ω	½	T60-729	BTS-1500	
R19	2000Ω	10	T60-879	1 3/4A-2000	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Silvertone PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	10KΩ	3.3Ω	592Ω	.88Ω	80-276	A-3879 ①	A-2900①	RO-16 ①	S-11X ①	① Bend mounting tabs down, file out slots, mount on orig. bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Silvertone PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.3Ω	79-405	ST-105 Mod. P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Silvertone PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	.6Ω		T82-74				
L2	RF Coil	11Ω	10.5Ω	T10-535				
L3	Osc.Coil	6.5Ω	13Ω	T10-553			70-Osc.*	Sec.tapped @ 7Ω
L4	Input IF	20Ω	20Ω	T10-508	16-6758	BC-352	12-C1	
L5	Output IF	20Ω	20Ω	T10-508	16-6758	BC-353	12C-C2	

* Disregard top on secondary winding.

SELENIUM RECTIFIER

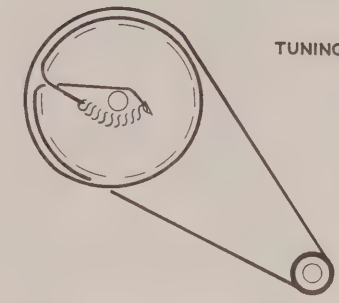
ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	Silvertone PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.064ADC	83-642	NA5	5M4	1002A	6S65	65

BATTERIES

ITEM No.	VOLTAGE	Silvertone PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	"A" -9 "B" -90	6407			753			F6A60	

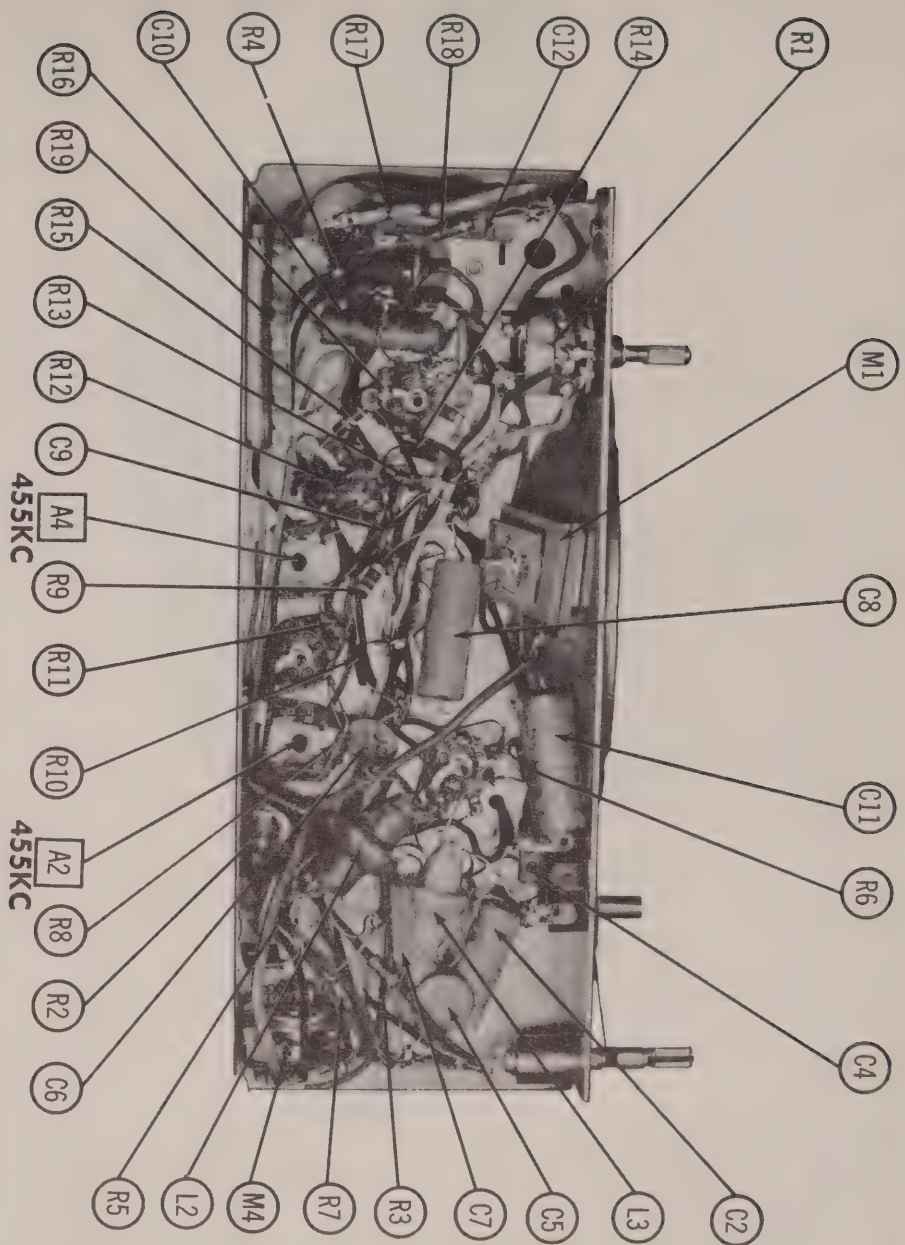
MISCELLANEOUS

ITEM No.	PART NAME	Silvertone PART No.	NOTES
M3	Tuning Capacitor	T19-226	20-320MMF, 13-215MMF, 9-80MMF
M4	Switch		AC/DC Battery Selector
	Cabinet	T42-529	
	Escutcheon	T40-229	
	Pointer	T58-95	
	Cover (Pointer)	T71-59	
	Knob	T52-382	Volume, Tuning (2 used)



DIAL CORD DRIVE

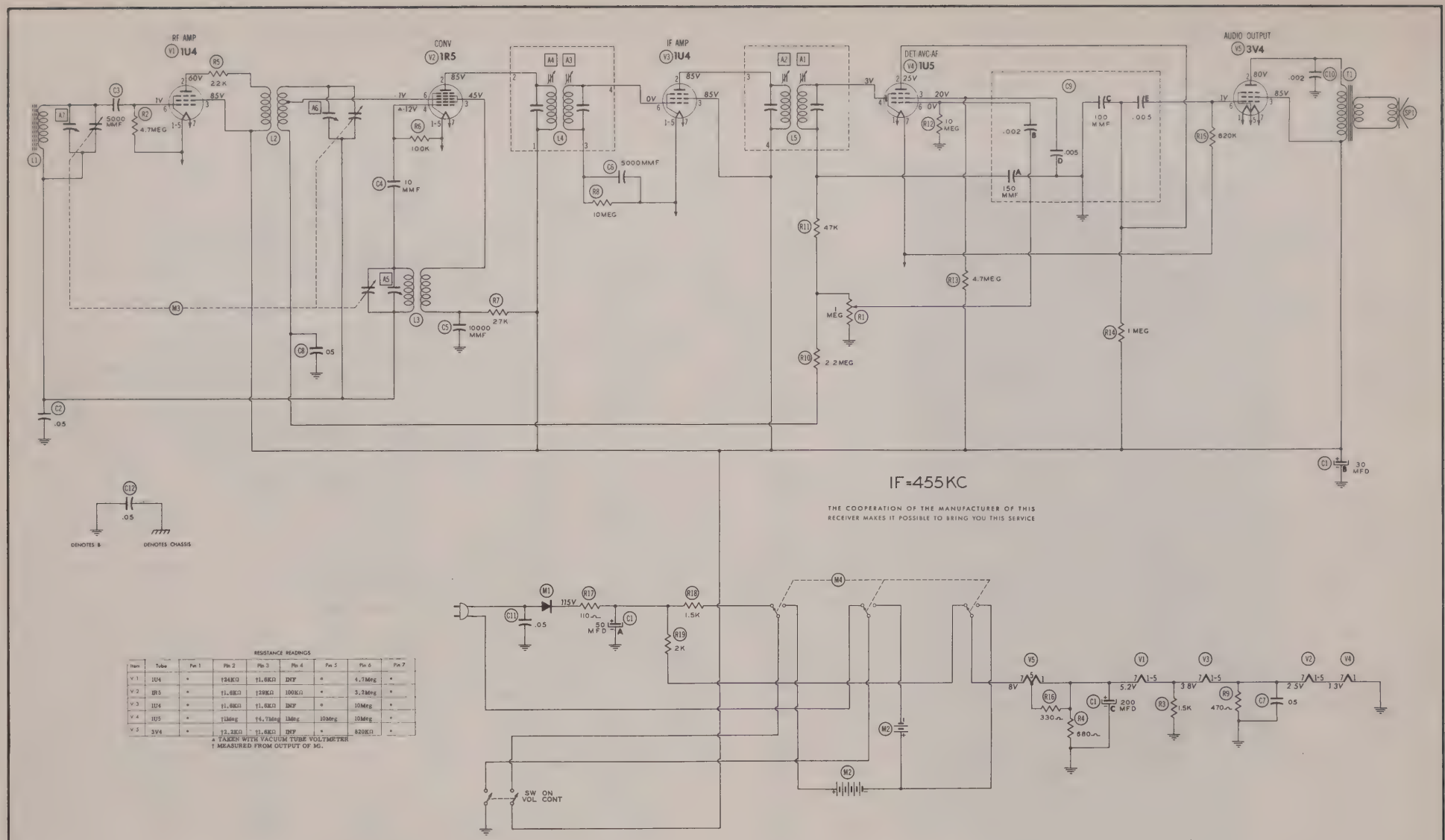
CHASSIS—BOTTOM VIEW



SET 208 FOLDER 12

SILVERTONE MODEL 255 (Ch. 528. 233)

SILVERTONE MODEL 225 (Ch. 528. 233)



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U4	*	†34KΩ	†1.6KΩ	INF	*	4.7Meg	*
V 2	1R5	*	†1.6KΩ	†28KΩ	100KΩ	*	3.2Meg	*
V 3	1U4	*	†1.6KΩ	†1.6KΩ	INF	*	10Meg	*
V 4	1U5	*	†1Meg	†4.7Meg	1Meg	10Meg	10Meg	*
V 5	3V4	*	†2.2KΩ	†1.6KΩ	INF	*	820KΩ	*

* TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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208-12

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

WEBSTER-CHICAGO
MODELS 126, 127, 129

Figure 1

GENERAL INFORMATION

The Webster-Chicago Model 126 basic mechanism is a three speed, automatic record changer. It provides automatic playing of up to a 1" stack of 7-inch, 10-inch and 12-inch records at speeds of 33 1/3, 45 or 78 RPM.

After the last record has been played the tone arm will return to its rest position and the changer will automatically shut off.

The motor switch is a function of the tone arm position and, the power is off when the tone arm is on the tone arm rest. Placing the arm on a record or depressing the "Reject" button starts the motor.

Manual operation is provided for playing "badly warped" records, "nonstandard" records or "home recordings".

Model 126 is designed for 105-120 volt operation. If it is desired to operate the changer on 50-cycle current, a 50-cycle adaptor kit is available. When ordering adaptor specify motor number (stamped on motor).

Manufactured by:

Webster-Chicago Corporation
5610 Bloomingdale Avenue
Chicago 39, Illinois

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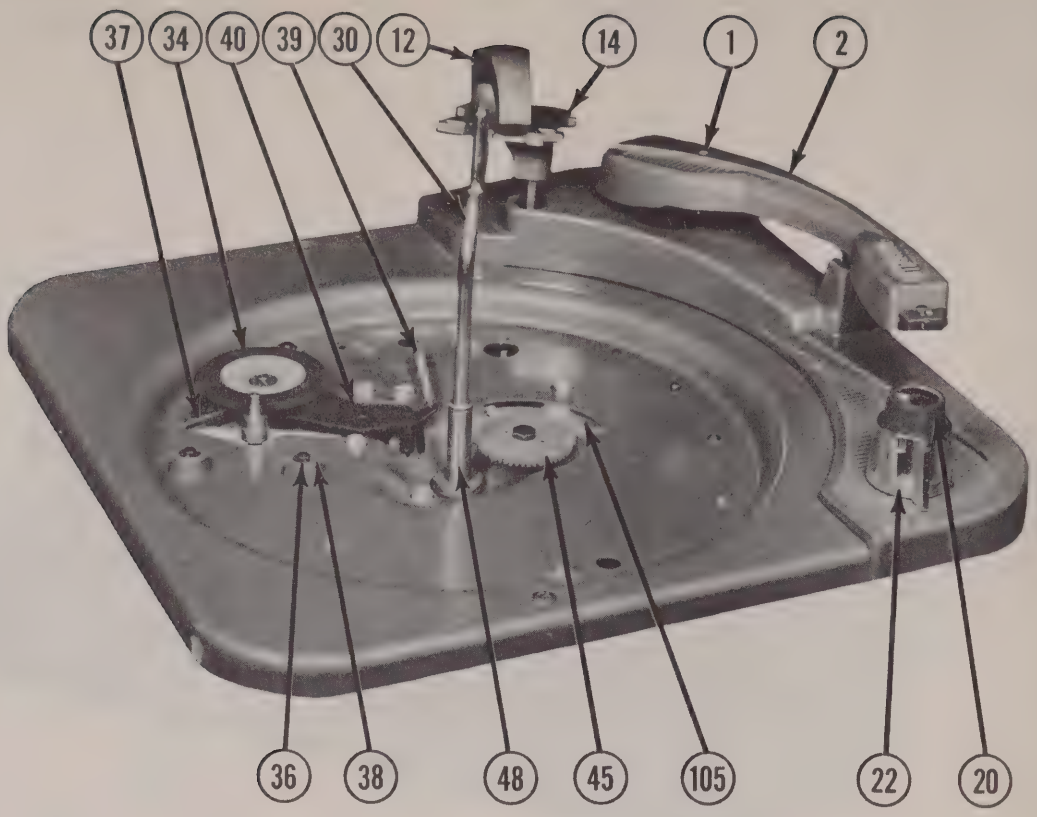

Figure 2

OPERATING INSTRUCTIONS

Automatic Operation-

1. Turn the Manual-Automatic control (reject button) to Automatic.

2. Place speed selector (22) and needle tip selector in the position corresponding to the type records to be played.

3. Turn record selector (14) to correct position for 7", 10" or 12" records.

4. With record weight (12) lifted and turned to one side, place up to a 1" stack of records on the spindle step and step of record selector (14).

NOTE: 33 1/3, 45 and 78 RPM records cannot be intermixed. The speed selector (22), needle tip selector and record selector (14) must be reset for each type record.

5. Depress reject button (20) and hold down until tone arm begins to move. The changer will now operate automatically until the last record has been played, at which time the tone arm will return to its rest and the mechanism will shut off.

Rejecting-

To reject a record at any time while changer is in automatic operation, depress reject button (20) and hold down until tone arm begins to move.

Neutral Position-

When the changer is to be out of service for any length of time, it should be left in neutral position. This position is identified by the dot to the left of the "78" speed setting. When in this position, the idler wheel is held away from the motor drive sleeve, thereby preventing any flat spots from developing on the rubber tire.

MANUAL OPERATION

1. Turn the Manual-Automatic control (reject button) to "Manual".

2. For ease of placing a record on the turntable, turn the record selector to the 12" position.

3. Place record on turntable.

4. Place speed selector (22) and needle tip selector in the position corresponding to the type record to be played.

5. Place the needle gently on the first groove of the record. To stop the mechanism at any time place the tone arm on its rest.

CHANGE CYCLE

A 4 pole shaded motor is used to drive the changer mechanism. The power is transmitted to the turntable by idler wheel (34). Turntable speed is determined by the positioning of idler wheel (34) on one of the three "steps" of the drive sleeve on the rotor

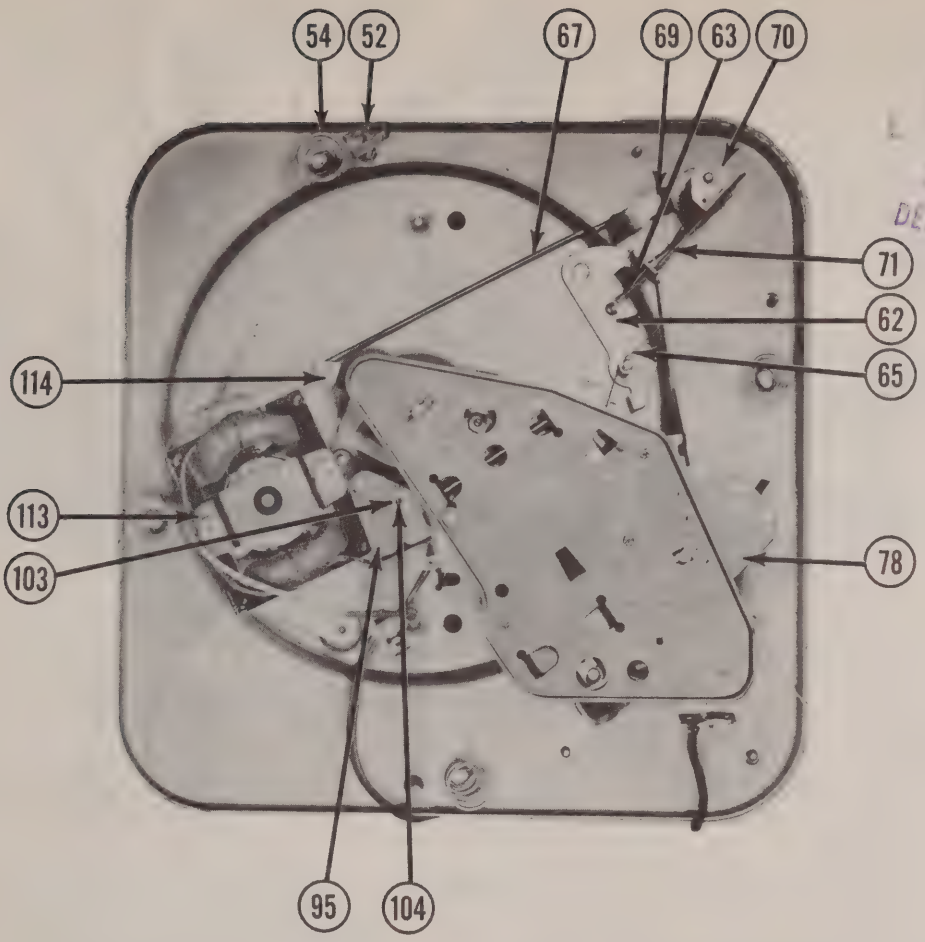

Figure 3

shaft. When speed selector (22) is turned to "33" the idler wheel is positioned on the "33 step" or contacts the smallest diameter portion of the sleeve. Turning the speed selector to "78" positions the idler wheel on the largest diameter of the sleeve.

This changer is provided with what is known as a velocity type trip. The change cycle is started by the faster inward motion of the tone arm when the needle enters the eccentric groove at the end of a record.

As the tone arm tracks on the record toward the spindle, it carries the velocity trip arm (74) with it through the frictional condition set up by clutch weight (73). The velocity trip arm (74) gradually approaches the velocity trip lever (75) and, upon contact, carries the lever with it. However, the main actuating gear (105) has four equally spaced projections on its circumference which strike the velocity trip rubber bumper (75A) as the gear revolves. This action forces the velocity trip arm (74) and the velocity trip lever (75) back away from the tripping point. The above action does not affect the tone arm because the friction set up by the friction clutch is not sufficient to hinder the tracking of the needle. When the needle enters the eccentric groove at the end of a record, the velocity trip arm (74) moves at such speed that it carries the velocity trip lever (75) to the tripping point between the projections on the main actuating gear (105). This releases actuating pawl (109A Fig. 4) on main cam (109), allowing it to engage the main actuating gear (105) which is continuously rotating with the motor driven turntable. Main cam (109) now engaged with main actuating gear (105) drives the changer through the change cycle.

Main cam (109) has two cam surfaces on its lower side. The inside cam surface forms a track in which the stud of the tone arm raising lever (122) rides. The main cam (109) actuates the raising lever causing it to raise and pivot outward. This motion is transmitted to the tone arm by the clutch action between the raising disc (82) and the set-down plate (79) which are attached to the tone arm shaft (28). The tone arm is now raised and moved away from the turntable.

When the tone arm has reached its farthest outward excursion, the roller assembly, following the contour of the main cam (109), transmits a forward motion to the rocker arm and record selector (14). The selector in moving toward the spindle pushes the bottom record of a stack from the spindle step, resulting in the lowering of a record to the turntable.

After the record has been lowered, the stud on the raising lever (122) carries the set-down plate (79), and consequently the tone arm, inward. The inward travel of the tone arm is stopped when the 7", 10" or 12" extension of the set-down plate (79) contacts the ear on stop lever (123).

The stop lever (123) is a function of the record selector shaft (83). Therefore, when the record selector is rotated to the proper record size position the stop

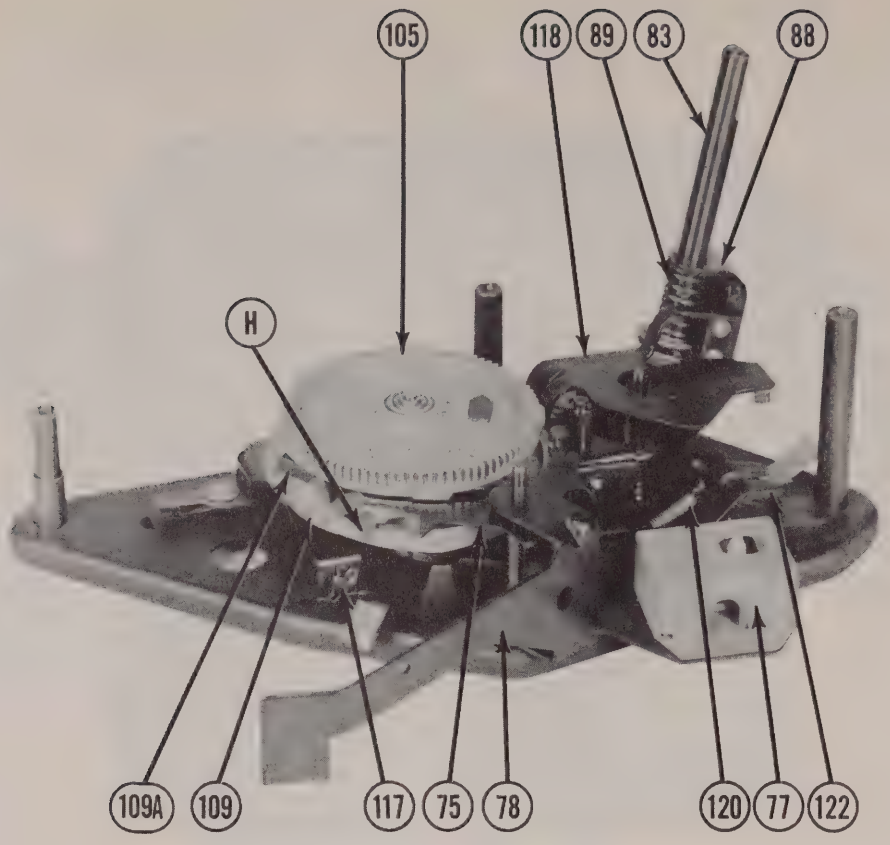

Figure 4

lever is positioned automatically to stop the set-down plate (79) at the correct set-down point.

Although the inward travel of the tone arm is stopped at one of the set-down positions, the slipping clutch allows the raising lever (122) and raising disc (82) to continue their inward travel. When the raising lever lowers to its normal position, the tone arm lowers and correctly sets down on the lead in groove of the record.

The hook end of the velocity trip lever (75) now catches the cycle actuating pawl (109A) and releases it from main actuating gear (105) which is continuously rotating with the motor driven turntable, thus completing the change cycle.

AUTOMATIC SHUTOFF

The weight of a record resting on the spindle keeps the no-record lever (118) from dropping. Therefore, when the last record is dropped to the turntable and the change cycle is completed, the no-record lever (118) is allowed to drop to its lowest position. Upon completion of the last record, the mechanism is tripped, starting a new change cycle; however, during this cycle, the inward movement of the tone arm is prevented by the engagement of the no-record lever (118) with the set-down plate (79). As a result, the tone arm comes to a rest on the arm rest and the set-down plate (79) contacts the AC switch shutting the changer off.

ADJUSTMENTS

Tone Arm Height-

The vertical movement of the tone arm is controlled by the contour of the raising lever (122). Correctly adjusted, the tone arm should clear the tip of the tone arm rest by 1/16" to 1/8" during the change cycle.

1. For adjustment of tone arm height, a set screw (1) is accessible through a hole on the top and at the rear of the tone arm.

2. Clockwise turning of the adjustment screw will raise the arm and counter-clockwise turning will lower it. (Caution: Do not turn excessively).

3. Lift the tone arm and place a dab of plastic cement on the base of the screw after the correct adjustment has been obtained. (Do not use a permanent type of cement and be sure it is not placed on the shoulder or end of the screw).

Needle Set Down-

1. Place a 7" record on the spindle and record shelf. Turn reject button to "Automatic".

2. With speed selector (22) in the neutral position, press the reject button and revolve turntable by hand. Stop rotation of turntable when needle is approximately 1/4" above the record.

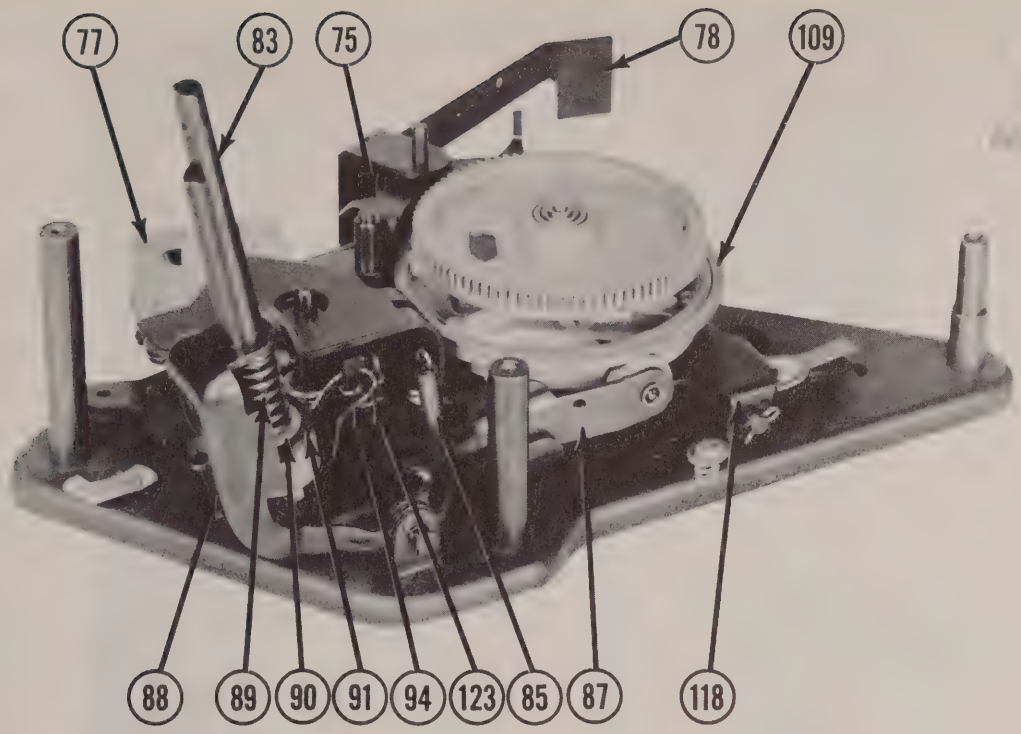

Figure 5

3. Check to see if the needle is directly above the lead-in groove of the record. If not, adjust by turning screw (10). (Clockwise turning of screw will move tone arm away from spindle).

4. If adjustment on 7" is correct, 10" and 12" set down will also be correct.

Needle Pressure Adjustment-

1. Lift the tone arm to a vertical position.

2. Insert a small steel rod in the hole of the spring mounting stud (point "A" on exploded view). Turn the mounting stud downward to increase, or upward to decrease the needle pressure.

CAUTION: A slight movement of the stud will have great effect. An accurate guage is necessary to insure correct needle pressure. Most cartridges require 9 to 11 grams for proper tracking and best reproduction.

Record Selector Post Angle-

The record selector (14) should be adjusted so that the curve of the shelf matches the curve of the record.

To Adjust This Angle-

1. Turn the record selector to the 10" position.

2. Place a 10" record on the spindle step and step of record selector.

3. With a No. 8 Bristol wrench in each set screw (93) alternately loosen one and tighten the other until the record selector angle is correct.

TROUBLES

Incorrect Turntable Speed-

1. Defective idler wheel (34) or wheel is cocked at an angle.

2. The idler wheel may not rest on the steps of the motor drive sleeve correctly. To adjust place speed selector (22) in the 45 RPM position, loosen nut (103), then turn screw (104) to raise or lower the idler wheel so that its edge is vertically centered on the 45 RPM step of the sleeve. After obtaining correct adjustment, tighten nut (103).

Erratic Speed-

1. Defective idler wheel. (Flat spots).

2. Dirt or grease on rubber tire of idler wheel, drive sleeve or on the turntable rim. Clean with alcohol.

3. If the rubber composition of the idler wheel is slick or shiny replace with new wheel.

4. Check to see if drive sleeve is loose on rotor.

Changer Fails To Change Records Automatically-

1. Check for dirt or grease on friction clutch (73). Clean with alcohol so that velocity trip arm (74) may move freely.

2. Velocity trip (75) binding on its mounting post.

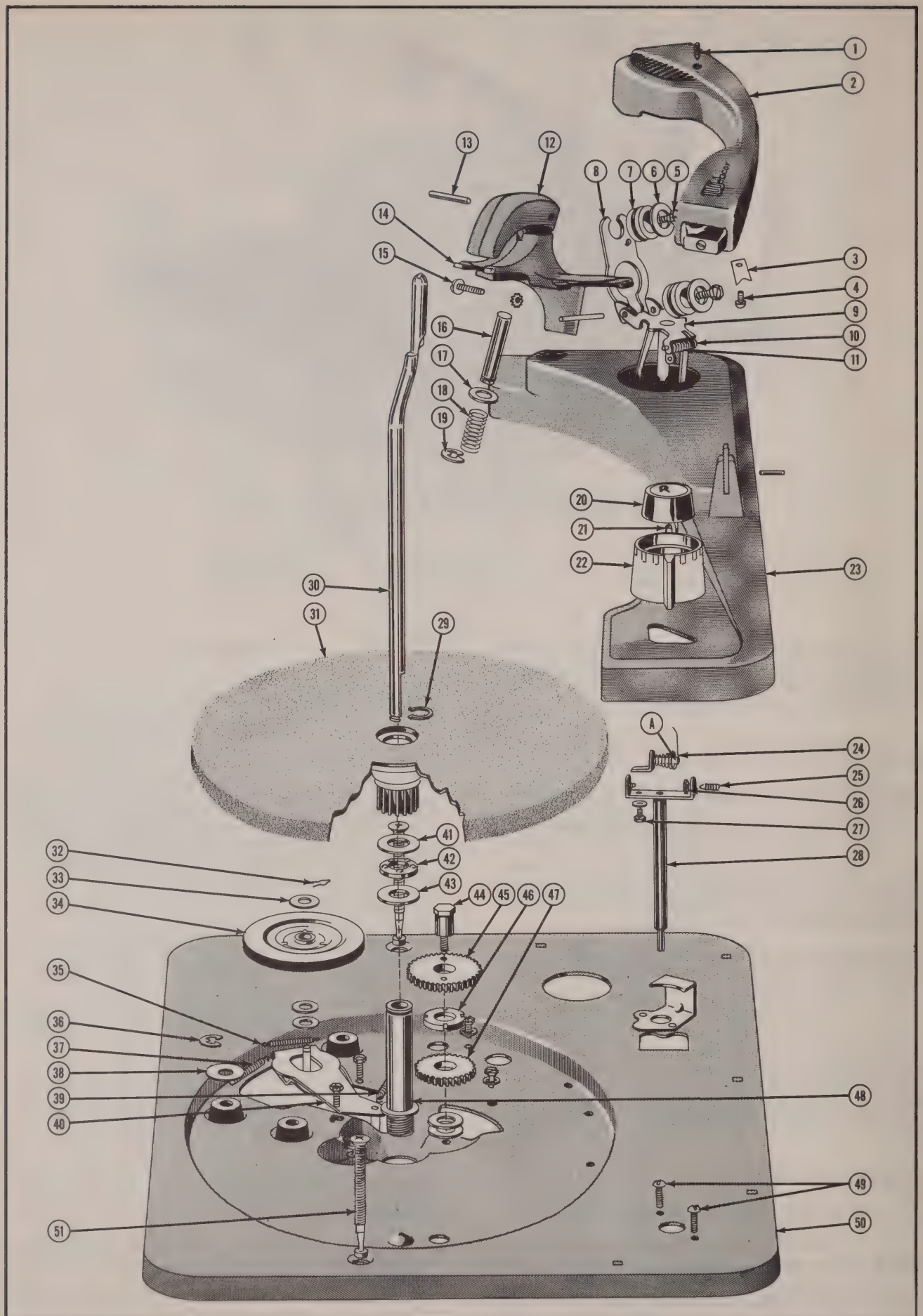

Figure 6A. Exploded View Of Parts Above Baseplate.

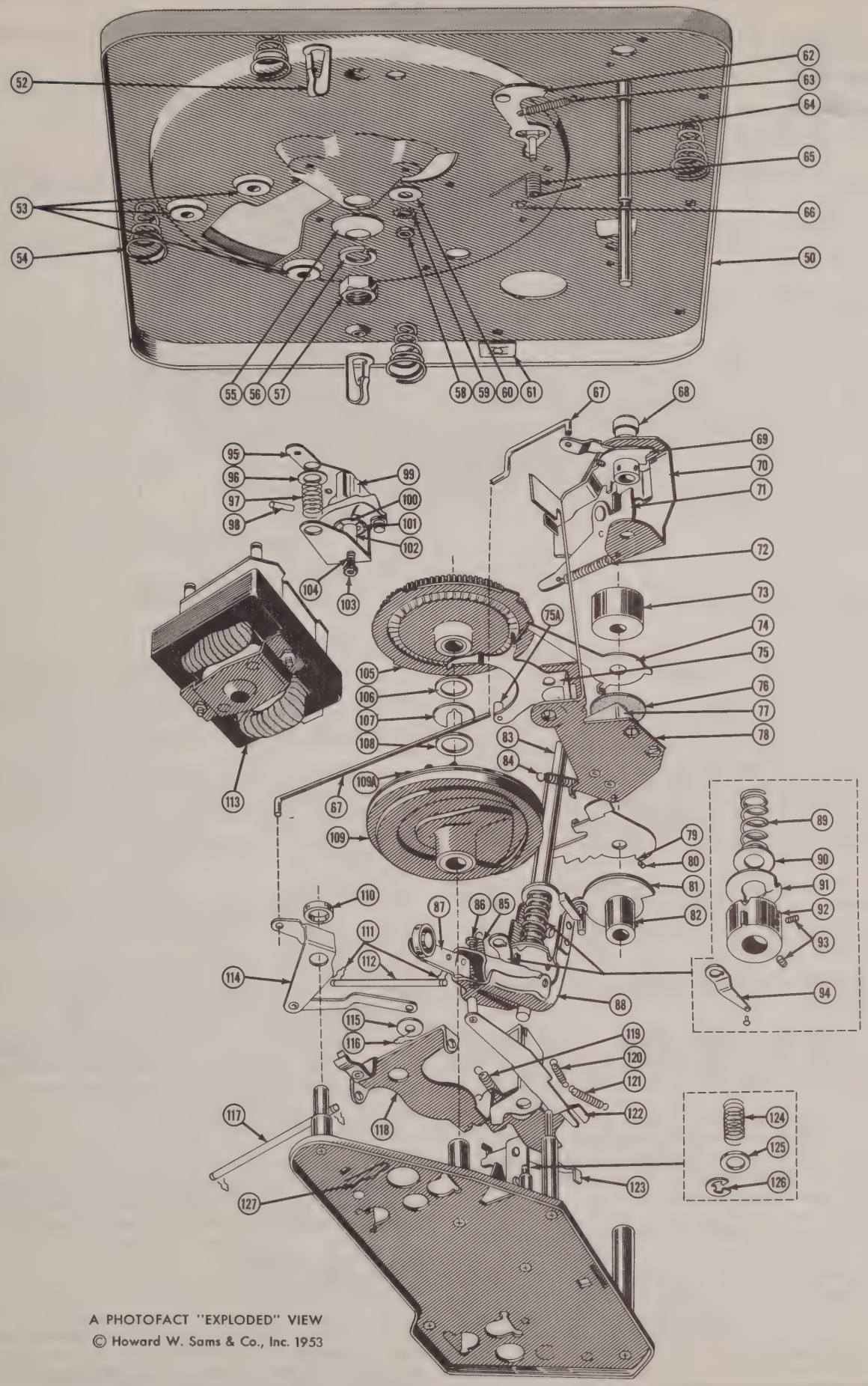

Figure 6B. Exploded View Of Parts Below Baseplate.

3. Burr on the end of cycle actuating pawl (109A) or on the underside of the hooked end of the velocity trip (75).

4. Velocity trip arm (74) bent and not hitting the ear of velocity trip (75).

5. Velocity trip arm (74) catching on AC switch cover (77).

6. Rubber bumper (75A) on velocity trip (75) damaged - needs replacing.

7. The end of velocity trip (75) catching on the top of raising lever bracket (122).

8. Velocity trip (75) may be rubbing on the underside of drive gear (105). There should be a clearance of approximately 1/16" between the trip and drive gear. Bend end of trip to adjust for this clearance. (This condition can also produce a chatter during operation).

9. Sticking actuating pawl (109A).

10. Defective record.

11. Badly bent or worn needle.

Changes Records Prematurely Or Cycles Continuously-

1. Rubber bumper (75A) on velocity trip worn or missing. Replace if required.

2. Reject trip spring (65) binding.

3. Too small a clearance between lip (H) of velocity trip (75) and the edge of main cam (109). (Refer to Figure 4). Too small a clearance may permit cycle actuating pawl (109A) to bounce past the hook end of velocity trip and re-engage main actuating gear (105), causing the mechanism to continue to cycle.

Clearance between lip (H) and main cam (109) should be 1/64" to 1/32" when rubber bumper (75A) is contacting one of the protrusions on main actuating gear (105).

4. Velocity trip (75) scraping on raising lever bracket (122).

Tone Arm Will Not Swing Far Enough Outward To Set On Tone Arm Rest Properly (Refer to Exploded View)-

1. Bend the stop ear, point (79), on the set down plate so that the tone arm swings out no further than 1/2" beyond the tone arm rest before starting its inward travel. (Bending the ear up will increase the swing - bending down will restrict it).

2. If the set-down point is affected by this adjustment, readjust set down.

Cannot "Reject" Records-

1. Bent ear on velocity trip (75). Cannot contact reject spring (65).

2. Bent reject spring (65). Cannot contact ear on velocity trip (75).

3. Reject spring (65) may not be threaded through hole in reject lever (78).

4. Bottom of velocity trip (75) scraping on raising lever bracket (122).

5. Reject lever (122) bent.

6. Reject spring (65) may be positioned on wrong side of velocity trip ear.

7. Lock lever (69) is binding in manual position thus locking the velocity trip.

Does Not Play Records Manually-

If the changer trips and cycles at the end of a record the velocity trip lock lever (69) is not locking the velocity trip. As the reject button (20) is rotated to manual, check for:

1. Slippage of lock lever (69) on control shaft (64). The set screws may be loose.

2. Ear on velocity trip is bent and not contacting the manual lockout lever (62).

3. Binding or bent manual lockout lever (62) and/or lock lever (69).

Stalls During Change Cycle-

1. Check position of idler wheel (34) on drive sleeve.

2. Check for low line voltage.

3. The idler wheel slide plate assembly (40) can be re-positioned by loosening the screws that hold it to the baseplate. The idler wheel can be placed in firmer contact with the drive sleeve by moving the slide plate assembly accordingly.

CAUTION: Do not move assembly excessively so that the idler wheel presses too tightly against the drive sleeve thus affecting correct speed.

Changer Does Not Shut Off Automatically Or When Tone Arm Is Placed On Its Rest-

1. The ear on the set down plate (79) is bent and does not strike switch tip properly in its downward travel or when tone arm is placed on its rest.

2. Defective AC switch.

3. There may be a burr on the plastic switch tip which restricts the movement of tone arm when arm is manually placed on its rest. Do not force arm but rather smooth off tip for easy shut off operation.

More Than One Record Is Lowered To The Turntable-

1. The top of the spindle may be bent in a direction away from the record selector shelf (14). If so, use a firm but careful thumb pressure to bend the top of spindle back slightly in a direction toward the record selector shelf.

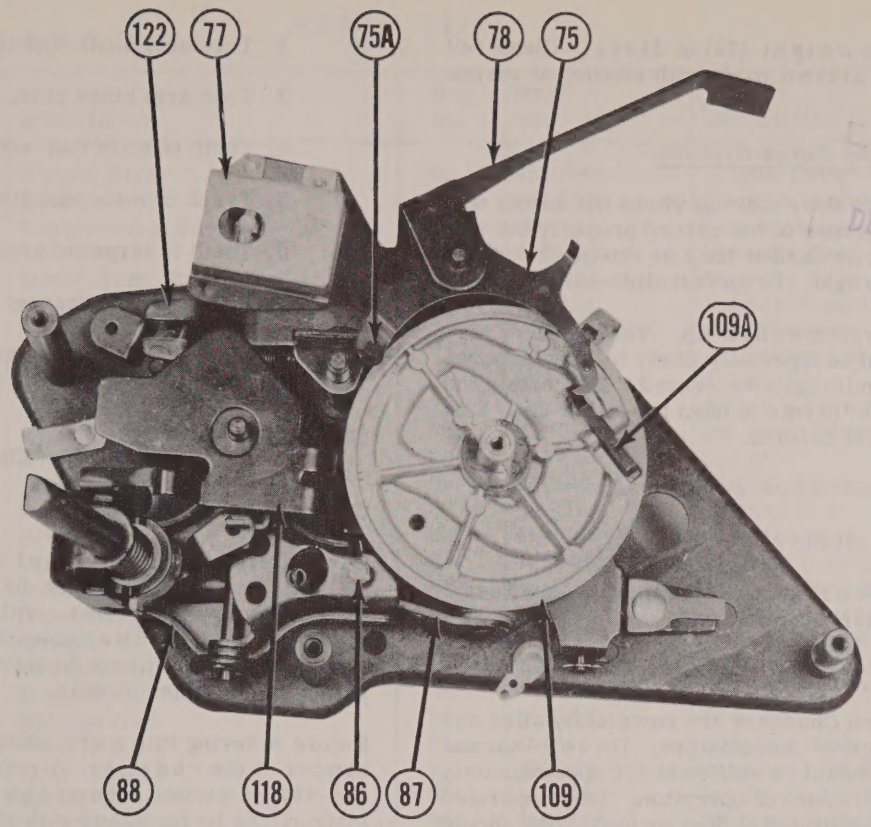

Figure 7

CAUTION: Do not bend excessively so as to damage the spindle or so that a single record can not be lowered. Do not leave a record on the spindle step when adjusting.

2. Records are exceptionally thin.

3. Check for foreign matter in spindle recess causing floating latch to stick.

Does Not Lower Records-

1. The top of the spindle is bent so that the spacing between the heel of the floating latch and the spindle step does not allow a record to slide between.

2. If this condition exists bend, with thumb, the top of the spindle slightly in a direction away from the record selector shelf.

CAUTION: Do not bend excessively so as to damage the spindle or, so that more than one record is lowered. Do not leave record on spindle shelf while adjusting.

Record Drops On Tone Arm-

1. The distance between the record selector shelf (14) and the spindle is incorrect.

2. With the mechanism in normal playing position (not in change cycle) set the record selector shelf to the 12" position. Place a 12" record on the spindle after first removing the turntable.

3. Insert a short handled screw driver into the hole of the baseplate so that rocker arm adjusting screw (86) can be rotated. Counterclockwise rotation of the screw will increase the distance between the record shelf and spindle. Clockwise rotation will decrease it.

4. The distance between the edge of the record and the step of the record selector shelf should be approximately 1/32". Be sure a standard size record is used.

Glide In On 12" Records-

The term "glide in" is used to describe the action of the tone arm and needle when the needle glides over the first two or three grooves before seating itself properly. If glide in occurs:

The pickup cord may be dressed too tight or in such a manner that it interferes with the free movement of the tone arm. Make certain there is sufficient play in the pickup cord.

Change Cycle Starts When Needle Touches Record-

1. If the changer cycles at the instant when the needle sets down on a 7" or 10" record the velocity trip arm (74) may be too close to the velocity trip (75) when needle contacts the record. Bend the ear on the velocity trip downward (very slightly) so there is more clearance between the tip of trip arm (74) and this ear.

CAUTION: Use care in bending so entire velocity trip is not distorted.

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2. Clutch weight (73) is dirty. Clean felt washer (76) and allied parts with alcohol or carbon tetrachloride.

Slide-In Or Needle Jumps Grooves-

Slide-in describes the condition where the needle will touch the first groove of the record properly but will jump the grooves forward or back as though the needle pressure was too light. To correct slide-in, check for:

1. Incorrect needle tip. The standard "78" tip will be expecially likely to jump grooves of a microgroove record. Be certain the "33-45" needle is used for either 33 1/3 or 45 RPM records.
2. Chipped or bent needle.
3. Tight pickup cord.
4. Needle pressure too light. See "Needle Pressure Adjustment".

LUBRICATION

Model 126 Record Changers are completely oiled and lubricated at time of manufacture. Under normal conditions this should be sufficient for approximately one year or 1,000 hours of operation. When operated under extreme conditions of dust or heat, they should be oiled more frequently, as required.

Do not permit oil or grease to get on the rubber idler wheel, motor sleeve, turntable drive rim, velocity trip arm clutch or raising disc clutch. Any oil or grease on these points should be removed using alcohol. The recommended lubricants and points of lubrication are as follows:

A-No. 10 Oil (Apply with small oil can or medicine dropper)

1. Motor bearings - (1 drop).
2. Tone arm shaft (28).
3. Ball bearing assembly under turntable.

B-A Non Fluid Lubricant (Apply with small brush)

1. Idler wheel link.
2. Turntable shaft stud (48).
3. Tone arm hinge pins.
4. Teeth of main cam actuating gear (105).
5. Track of main cam (109).
6. Teeth of large and small idler gear (45 & 47).
7. Raising lever bracket bearing surface.
8. Flag end of reject lever (78) at point of contact with toggle lever (71).

PRODUCTION CHANGES

Crescent Assembly (23)-

Current production crescent assemblies (Part No. 11X1001) have slightly larger diameter mounting studs than previous assemblies. This provides for more secure mounting to the baseplate. The studs on current manufacture will not fit into the baseplate mounting holes of earlier models.

Before ordering this part determine the production number of the changer involved. If the number is 375-247 or earlier request that specific installation instructions be furnished with crescent assembly.

Models B126 now in production are of a two-tone Burgundy color. The suffix (-BE) designates a dark Burgundy color. Changers bearing production numbers 375-247 or earlier are of a single tone, light Burgundy and do not incorporate the dark Burgundy color. Current and future production of the parts listed below will be in dark Burgundy.

1. Selector and weight assembly, No. 11G994-BE
2. Record weight, No. 42P239-BE
3. Record selector, No. 49P145-BE
4. Crescent assembly, No. 11X1001-BE
5. Tone Arm, No. 42P300-1BE

This change does not affect the Russet and Cream colors (R126).

PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part. No.	Description
	21X344	Tone Arm Hinge and Shaft Assembly-includes items 1, 5 thru 11 and 24 thru 28	9	21X331	Tone Arm Hinge
			10	26P1246	Adjusting Screw-Set Down
			11	46P299	Compression Spring
1	26P1285	Adjusting Screw-Height		11G994-1	Model B126 Selector & Weight
2	42P300-1BE*	Model B126, Tone Arm		11G994-2	Model R126 Assembly-includes items 12, 13, 14 & 16 thru 19
	42P300-1RR	Model R126, Tone Arm			
3	45P1509	Tone Arm Latch Plate	12	42P239-BE*	Model B126, Record Weight
4	26P1191	Self Tapping Screw		42P239-RR	Model R126, Record Weight
5	26P965	Mounting Screw-Tone Arm	13	27P237	Roll Pin
6	25P257	Washer	14	49P145-BE*	Model B126, Record Selector
7	25P558	Rubber Grommet		49P145-RR	Model R126, Record Selector
8		Tone Arm Hinge (part of item 9)	15	26P1300	Screw (includes washer)

PARTS LIST
(Cont.)

Ref. No.	Part. No.	Description	Ref. No.	Part No.	Description
16	41P844	Weight Shaft	71	45P1540	Toggle Lever
17	25P339	Washer	72	46P332	Tension Spring
18	46P232	Compression Spring	73	41P1152	Clutch Weight
19	25P447	"C" Washer	74	45P1552	Velocity Trip Arm
20	39P098-E	Model B126, Reject Knob	75	11X320	Velocity Trip
	39P098-R	Model R126, Reject Knob	75A	24P023	Rubber Bumper-Velocity Trip
21	26P629	Set Screw for item 22	76	23P009	Felt Washer
22	42P310-1	Speed Selector	77	11X876	AC Switch Cover Assembly
23	11X1001-BE*	Model B126, Crescent and Rest Assembly		32X089	AC Switch
			78	11X990	Reject Lever Assembly
	11X1001-RR	Model R126, Crescent and Rest Assembly	79	11X1041	Set Down Plate
			80	26P629	Screw
24	21X335	Tone Arm Counterbalance	81	28P010	Clutch (Cork)
25	26P1267	Pivot Screw	82	11X939	Raising Disc
26	26P1247	Hex Nut	83	41P1230	Selector Shaft
27	26P1253	Screw	84	46P326	Tension Spring-Reject Lever
28	21X343	Tone Arm Shaft	85	46P161	Tension Spring
29	50P221	Retainer-Turntable	86	26P316	Adjusting Screw Rocker Arm
30	11X713	Spindle	87	11X141	Rocker Arm Roller Assembly
31	11X878-E	Model B126, Turntable	88	45P583	Rocker Arm Lever
	11X878-RR	Model R126, Turntable	89	46P012	Compression Spring
32	50P125	Hairpin Clip	90	25P343	Washer
33	25P430	Washer	91	45P194	Selector Stop
34	11X935	Idler Wheel	92	11X1032	Selector Link & Collar Assy.
35	46P331	Spring	93	26P629	Set Screw for item 92
36	25P335	"C" Washer	94	45P1665	Selector Link(Part of item 92)
37	46P314	Tension Spring-Slide Plate		11X950	Idler Wheel Slide Plate Assembly-includes items 35, 40 and 97 thru 104.
38	25P394	Washer			
39	46P330	Tension Spring-Slide Plate			
40	11X946	Pivot and Slide Plate Assembly	95	45P1565	Idler Bracket
41	25P269	Bearing Race Washer	96		Washer
42	11X058	Bearing Race	97	46P305	Compression Spring
43	25P269	Bearing Race Washer	98	27P282	Groove Pin
44	41P333	Shoulder Screw	99	11X949	Cam and Stud Assembly
45	47P024	Large Idler Gear	100	25P578	Washer
46	45P342	Idler Gear Coupler	101	25P574	"C" Washer
47	47P023	Small Idler Gear	102	41P1159	Cam Shaft
48	41P1234	Turntable Bearing	103	26P077	Hex Nut
49	26P214	Screws for mounting Reject Bracket	104		Adjust. Screw(Part of item 102)
			105	11X032	Main Actuating Gear
50		Baseplate	106	25P343	Washer
51	26P1045-1	Mounting Screw	107	25P342	"C" Washer
52	50P252	Mounting Clip	108	25P083	Washer
53	24P078	Rubber Grommet	109	11X722	Main Cam
54	46P307	Mounting Spring	110	41P1162	Spacer
55	25P289	Cup Washer	111	50P125	Hairpin Clip
56	25P403	Lockwasher	112	41P421	Rocker Arm Pin
57	26P687	Hex Nut	113	15X152	Motor & Top Bridge Assembly
58	26P046	Hex Nut	114	11X936	Link Assembly(Speed Selector)
59	25P222	Lockwasher	115	25P549	Washer
60	25P367	Washer	116	50P125	Hairpin Clip
61	26P697	Speed Nut for MountingItem 23	117	41P443	No Record Lever Pin
62	45P1539	Manual Lockout Lever	118	11X1040	No Record Lever
63	46P314	Tension Spring	119	46P329	Tension Spring
64	41P1187	Control Shaft	120	46P022	Tension Spring
65	46P288	Torsion Spring-Reject	121	46P330	Tension Spring-Raising Lever
66	25P447	"C" Washer	122	11X1038	Raising Lever Assembly
67	45P1597	Speed Change Rod	123	45P1664	Set Down Plate Stop Lever
68	11X965	Selector Link and Bushing	124	46P325	Compression Spring
69	11X964	Lock Lever	125	25P361	Washer
70	11X989	Reject Bracket and Toggle Lever Assembly	126	25P447	"C" Washer
			127	50P204	Spring Clip

* See "Production Changes" before ordering.